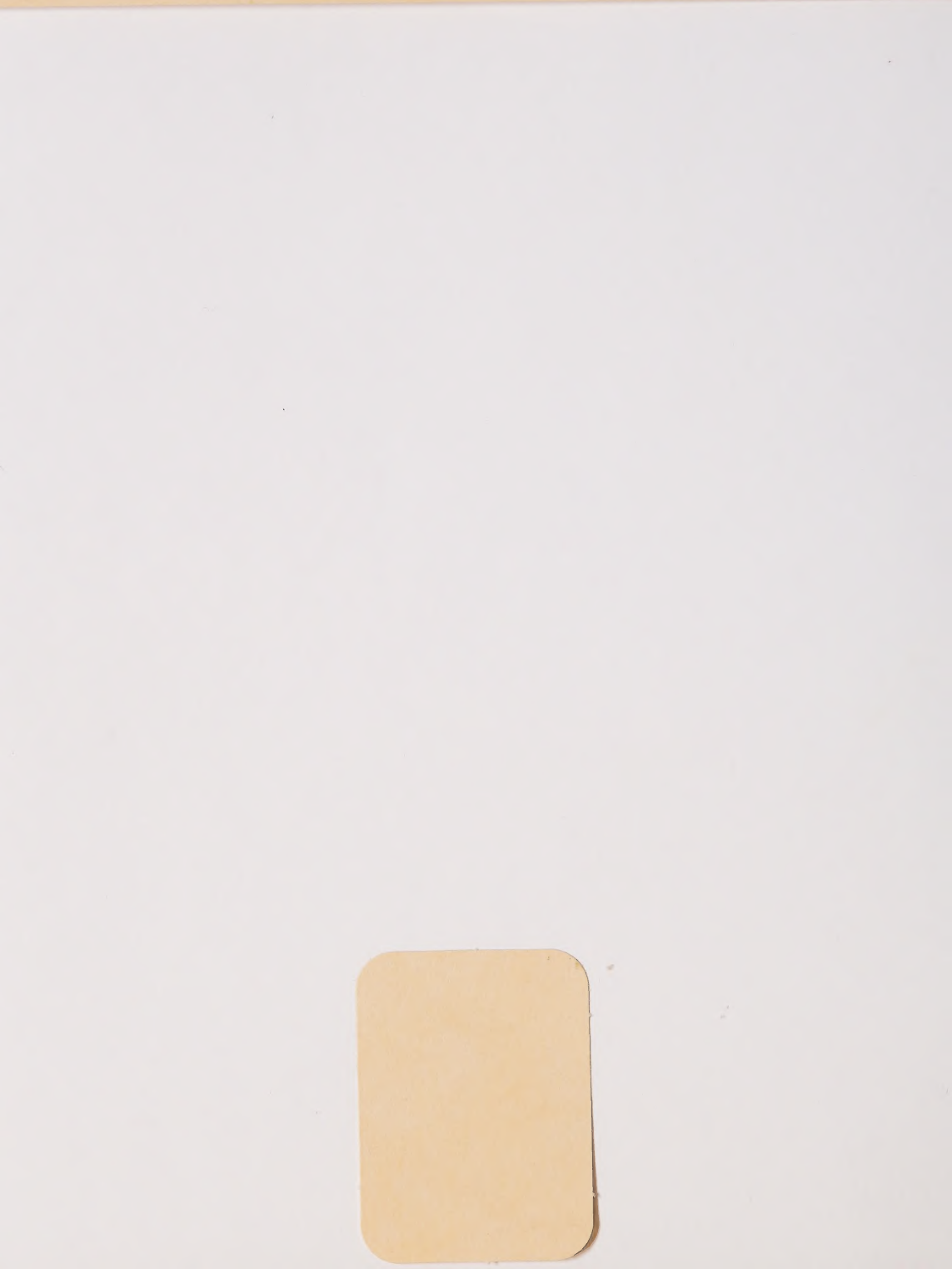
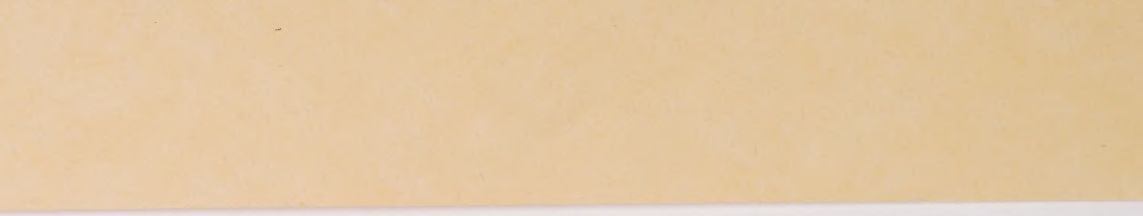


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DEPARTMENT OF THE INTERIOR

Hon. Thomas G. Murphy, *Minister*H. H. Rowatt, *Deputy Minister*

NORTH WEST TERRITORIES AND YUKON BRANCH

O. S. Finnie, *Director***CANADA'S WESTERN ARCTIC**

**Report on Investigations in
1925-26, 1928-29, and 1930**



Ottawa

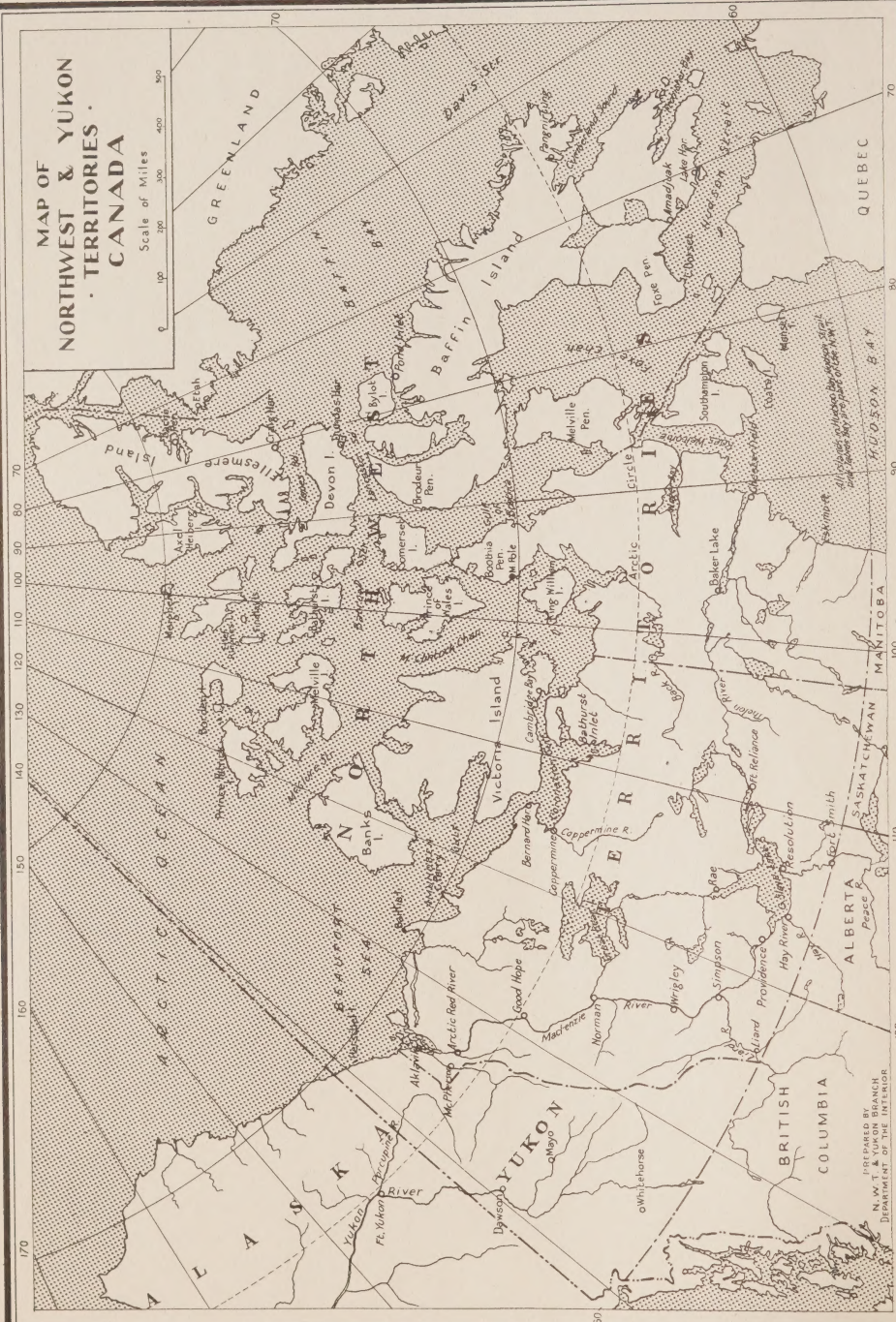
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Printer to the King's Most Excellent Majesty
1931

MAP OF NORTHWEST & YUKON TERRITORIES CANADA

Scale of Miles

0 100 200 300 400 500



PREPARED BY
N.W.T. & YUKON BRANCH
DEPARTMENT OF THE INTERIOR

DEPARTMENT OF THE INTERIOR
HON. THOMAS G. MURPHY, *Minister* H. H. ROWATT, *Deputy Minister*
NORTH WEST TERRITORIES AND YUKON BRANCH
O. S. FINNIE, *Director*

CANADA'S WESTERN ARCTIC

Report on Investigations in
1925-26, 1928-29, and 1930

Major L. T. Burwash, M.E., F.R.G.S.,
Investigator



Ottawa
F. A. ACLAND
Printer to the King's Most Excellent Majesty
1931



LETTER OF TRANSMITTAL

DEPARTMENT OF THE INTERIOR

NORTH WEST TERRITORIES AND YUKON BRANCH

OTTAWA, May 15, 1931.

SIR,—I have the honour to transmit herewith a report by Major L. T. Burwash entitled "Canada's Western Arctic," being an account of investigations made by him in 1925-26, 1928-29, and 1930 in the Arctic region of Canada from the Mackenzie delta to King William island and Hudson bay. The investigations embraced: the Eskimos, their health and welfare; wild life; mineral deposits; natural resources; the fur trade; climate; travel and transportation; magnetic conditions in the neighbourhood of the magnetic pole; an examination of the area in which the Franklin expedition was lost; and the collection of data, photographs, and specimens in connection with these various activities.

I have the honour to be, sir,

Your obedient servant,


O. S. FINNIE,

Director,

North West Territories and Yukon Branch.

H. H. ROWATT, Esq.,

*Commissioner of the North West Territories,
Ottawa.*



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CANADA'S WESTERN ARCTIC

By Major L. T. BURWASH, M.E., F.R.G.S.

PART I

INVESTIGATIONS, 1925-26

INTRODUCTION

During the past fifteen years civilization has steadily extended its outposts until in 1925 not more than five hundred miles of our Arctic coastline (measured along its general course) remained unaffected by the trader and white trapper. The lines were ever extending, thus indicating clearly the necessity of developing a source of precise information regarding the Canadian Northland. It was decided by the Department of the Interior that one of its officers should undertake the trip along Canada's Arctic coastline, and the writer was directed to undertake the expedition.

The general instructions for the trip issued by Mr. O. S. Finnie, Director, North West Territories and Yukon Branch of the Department of the Interior, were comprehensive and suggested every possible medium for obtaining further knowledge of the North and its inhabitants. These included: taking a census of the Eskimos; making a survey of economic conditions; carrying out traverse surveys; securing botanical and biological specimens; studying the racial groups of the natives; furnishing reports on wild life on land and sea, on general natural resources, the weather, temperatures, barometer readings, tide measurements, ocean currents, and terrestrial magnetism; together with securing a supply of photographs as circumstances might dictate; the writer to use his own judgment in investigating any other subject he considered important.

AKLAVIK TO CAMBRIDGE BAY

Leaving Ottawa on July 2, 1925, the author reached Aklavik, at the mouth of the Mackenzie on July 31. After having engaged an Indian with a small schooner, the start to Shingle Point was made on August 5, and the following day he went aboard the Hudson's Bay Company's ship *Baychimo* at that post. As it was in this ship that the trip eastward along the Arctic coast was to be made, some time was spent loading supplies and equipment. At 5 a.m. on August 8, the ship left for Baillie island. No ice was encountered and the sea was calm until evening when a strong head wind developed which gave the schooner a rough passage. By evening the ship was somewhere off Richards island, but as the coastline of the delta and for many miles to the east is very low, no land could be seen. The weather was fine on the morning of the following day, but a good deal of ice had made its appearance, not enough, however, to interfere to any extent with the ship's progress. Land, which was reported to be only ten miles distant, could not be seen from the deck. Baillie island was sighted at noon and the ship anchored two hours later at a point one mile offshore.



1. Drying whale meat, Baillie Island. 2. Native woman, Tree River. 3. Royal Canadian Mounted Police house, Tree River. 4. Steamship *Baychimo*.

BAILLIE ISLAND

There is a good harbour at Baillie, but there was some doubt as to the amount of water over the bar across its entrance. On going ashore, we found the population to include two Royal Canadian Mounted Policemen, three Hudson's Bay Company employees, three other white men and about twenty natives. Unloading continued during August 9 and 10.

At 10 p.m. of the latter day, Klingenberg's schooner, *Maid of Orleans*, came into the harbour en route from Kent peninsula to Herschel.

The settlement at Baillie is situated on a very low sand-spit between the southeasterly corner of Baillie island and the mainland. There are two entrances to the harbour, one at either end of the sand-spit, the northern one being the deeper. There is no fresh water on the settlement site, both the Hudson's Bay Company and the Police depending on fresh water ice which, after being hauled from the mainland, is stored in barrels and tanks and allowed to melt as summer progresses. This settlement was originally an old-time whaling station.

Baillie was left at 5 p.m. on August 11, the day having been spent in bringing aboard Police supplies for Tree River. The settlement and its site on Baillie island presents very little of interest, but the tributary country is of real importance, supporting as it does a very considerable native population to which must be added possibly a dozen white men who make this country their home. The trapping for many miles along the adjoining coast has been consistently good for many years, the post producing a better average per hunter of white fox pelts than possibly any other Arctic district either east or west. This may, to a certain extent, be ascribed to the skill and ability of the trappers themselves who rank as among the best of our Eskimo population. Many of the natives are comparatively well to do, speaking English well, and cases of destitution are uncommon.

Baillie will for many years to come be outstanding as an Eskimo centre, being located far enough from the travelled routes to give good protection from the influx of too many white men, while the native hunters are close enough to get the benefit of a price for their furs that gives them every encouragement to pursue their vocation most actively. This point marks the eastern limit of what may be called the western influence on the native population. From Demarcation point thus far the native customs and styles of dress and ornamentation are very similar, noticeable among these being the old custom (now discontinued except by a few old men) of wearing labrets. These are made from ivory, bone, or stone, and inserted in a slit cut in the lower lip. The modern influence of the west is strongly marked, the people being much more advanced in business ideas than those to the eastward.

On leaving Baillie, the weather turned dark and cold with light snow in the air, and about midnight, off cape Parry, heavy pack ice was encountered. This necessitated a somewhat lengthy detour. The weather during August 12 and 13 was cloudy and cold, but there was little ice in sight and practically no wind. On the morning of August 12, a small schooner owned by the deStephens brothers was met. They had been trading and trapping on the south coast of Queen Maud gulf, between Melbourne island and the mouth of Ellice river and had had a most successful season, securing about 2,000 foxes for their winter's work.

BERNARD HARBOUR

Bernard Harbour was reached at 10 a.m. on August 12 and the ship anchored well inside the harbour and quite close to the Hudson's Bay Company's post. The harbour is very well sheltered and will take ships of twenty feet draught or even deeper. The settlement consists of the Hudson's Bay post

and an Anglican mission, all the buildings being quite small. There were resident there three white men, two white women, two white children, and many Eskimos.

The Hudson's Bay Company's schooner *Fort McPherson* was already in port, having arrived from Herschel island two days previously. The *Fort McPherson* was loaded with supplies for King William island. The whole of August 13, and most of August 14 were spent in unloading company and mission supplies. Much of our time was occupied ashore securing photographs and looking over the buildings and nearby country. The natives, both here and at Baillie island, appear prosperous and contented, the intervening country being possibly the best white fox area in the North.

Westward from Bernard Harbour along 400 miles of coastline to Baillie island lies what was for many years the barrier between the two main groups of Canadian Eskimos. For many generations no intercourse had been held between these settlements, a condition which remained until the advent of white men during the first decade of the present century. While much has been done during the past fifteen years to bridge this gap the differences in the two groups are still most apparent. The people in the Bernard Harbour area to-day include the original native population and many newcomers who formerly lived in southwest Victoria island but who, on account of the shortage of game, have moved over to the mainland.

Leaving Bernard Harbour at 4 p.m. on August 14 the *Baychimo* proceeded southeasterly through numerous islands and reefs to Tree River, a distance of about 100 miles. The harbour at this post is large and well protected, the land rising to a considerable elevation on all sides. Close on shore, however, the water is quite shoal and more or less trouble is experienced in lightering supplies to the post.

TREE RIVER

Tree River consisted of a Hudson's Bay Company post and a Royal Canadian Mounted Police post. The white population, at this time included three Royal Canadian Mounted Policemen and four Hudson's Bay Company employees. The land at Tree River settlement is not very suitable for a post site, much of it being low and wet. This has driven the buildings to the tops of two small rocky knolls which are windswept during the winter, making the buildings anything but comfortable. The Eskimos of the Tree River area are not very numerous and in appearance differ little from those at Bernard Harbour. The various native communities throughout Coronation gulf while carrying distinctive tribal names are in no way strangers to each other. During the sealing season they frequently travel in mixed bands, separating when the time arrives to set out for their summer hunting grounds. The surrounding region is not rated as being especially productive of either caribou or foxes although the latter were, during the season 1924-25, quite plentiful. The sea produces the greater part of the native foods, both fish and seal being taken in sufficient abundance during certain seasons of the year.

The area south of Coronation gulf is known to contain extensive mineral resources, notable among these being copper deposits. The more valuable resource of this area from a local viewpoint is the spruce timber lying some miles inland from which the coast natives draw a considerable part of their wood for sleds and implements.

Sailing from Tree River for Kent Peninsula at 1 a.m. on August 17, breakfast time found us coasting along a chain of high rocky islands, later in the forenoon cape Barrow being passed. Between Tree River and Kent Peninsula



1. Native house, Baillie Island. 2. Native woman, Kent Peninsula. 3. Native woman, Bernard Harbour. 4. Hudson's Bay Company's houses, Kent Peninsula.

post are many islands, the channels between some of which are shallow, but as the ocean bed is soft clay, a ship drawing eighteen feet can get through, though not without touching bottom.

KENT PENINSULA

At 5 p.m. the ship anchored at a point seven miles distant from Kent Peninsula post, the captain not caring to attempt to get closer on account of shallow water. Mr. W. H. B. Hoare, special investigator of the North West Territories and Yukon Branch, Department of the Interior, who had joined the *Baychimo* at Bernard Harbour, disembarked at this point as it was his intention to continue his study of the caribou in the country south of Bathurst inlet. As the day was occupied in unloading supplies, advantage was taken of the opportunity to conduct investigations and take photographs. Rt. Rev. J. R. Lucas, Anglican Bishop of Mackenzie River, who was a passenger on the ship on his regular visitation to missions on the coast, performed a marriage ceremony, the bride and groom being local natives.

A gasoline schooner named the *Kugyuk* which had been brought from Vancouver was unloaded here to be used as a trading outpost by the Hudson's Bay Company.

The *Baychimo* sailed at 1.30 a.m. on August 19, and by 6 o'clock was running northeasterly along the west end of Kent peninsula which was later followed along its northern coast until 7 p.m., when Cambridge Bay was reached.

CAMBRIDGE BAY TO KING WILLIAM ISLAND

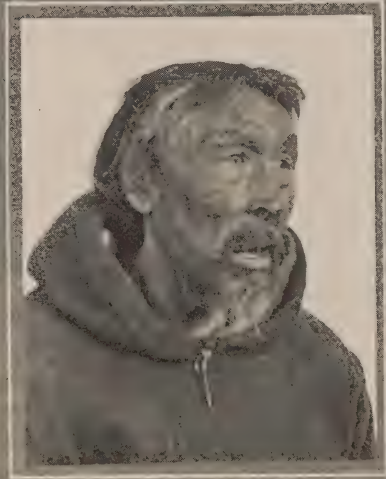
Owing to the failure of the caribou migration, which formerly crossed from Kent peninsula to Victoria island, at Cambridge Bay, the Hudson's Bay Company had withdrawn their agent from this post and while the post buildings were intact and the store fully stocked, the only inhabitants at the time of the ship's arrival were one Eskimo, his wife, and one child. This point had for many years been an ideal site for an Eskimo settlement, caribou and seal being plentiful and the fish more than abundant, but an Eskimo must have caribou skins for clothing, and must, when the migration fails, move elsewhere. The former residents of the Cambridge Bay area are now located along the southern shore of Queen Maud gulf. Upon arrival at Cambridge Bay, the *Baychimo* anchored about half a mile from the post, but during the night a hurricane developed which drifted the ship out towards the mouth of the harbour, a distance of over a mile, and this in spite of the fact that there were two anchors down and that the ship was steaming against the wind. The morning of the 20th broke with the weather quiet but foggy.

August 20 and 21 were spent unloading supplies for transshipment to King William island and points east, my outfit being included. These operations were continued until noon of the 22nd, when I transferred my personal baggage ashore and took up my quarters in the Hudson's Bay Company house with a Kent peninsula Eskimo, Ooja, who had also come ashore from the ship as my companion. The ship sailed during the afternoon.

Cambridge Bay marked the eastern limit of the white influence as the people beyond still live in the same primitive way as did their ancestors, the only change being that their bows and spears have, to a great extent, been superseded by firearms. In so far as their methods of living, their customs and religion are concerned, they are still as were their forefathers.

TOPOGRAPHICAL AND OTHER FEATURES

In appearance, the southeasterly corner of Victoria island is low-lying and desolate, the only relief observed from the coast at Cambridge Bay being an



1. Angote (the man) born at Akovoligjuak, now living with the Netselingmeuts. 2. Ootak (burned), Igloali, Melville Peninsula. 3. Akkoa (stern of boat), Aivilingmeut native, Repulse Bay. 4. Bye and Bye, Repulse Bay.

elevation of about 600 feet lying to the northeast, which is known as mount Pelly. The country is well served with lakes and streams, some of considerable size, and many of which are well stocked with fish and wildfowl. The only rocks were limestones, little or no rock of igneous origin being found even in the drift. The greater part of the country is overlaid by bluish clay varied by broken limestones. Only at one point was rock in place seen.

The harbour is some miles in extent and has ample water for boats of eighteen feet draught, although when passing the Finlayson islands shortly before entering the bay the water had shoaled rather ominously. Inside however there is very good protection from the sea but the land, low-lying as it is, affords little shelter from the violent winds which are anything but uncommon. No land mammals were seen but there were fair indications of fox and lemming. Before the natives deserted the area it was rated by them as a good trapping district.

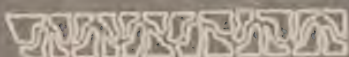
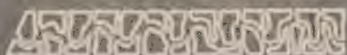
The waters of the bay and coastline outside are fairly stocked with jar and square flipper seal but no white whales were seen. The fishing in the lakes and streams is, as has been said, excellent, the most productive season being late September, immediately before the freeze-up.

At the time of leaving the ship no further schedule of travel could be decided upon. It was hoped that a small gasoline schooner, the *Fort McPherson*, would call at Cambridge Bay and make a trip to King William island with necessary supplies for the Hudson's Bay Company post at that point, but should she be prevented from carrying out this schedule the only alternative was to await winter and proceed eastward by dog team. Fortunately, after a lapse of eleven days, the *Fort McPherson* did arrive and the two hundred and fifty miles from Cambridge Bay to King William island was traversed by boat instead of the much slower and more arduous winter method. The population of Cambridge Bay now numbered five in all, Teetapkoo with his wife and child, Ooja, and myself.

Before the departure of the *Baychimo* the exact local time had been secured and a meridian established on shore. This with the observed position of Cambridge Bay, was the zero used during the following winter.

During the last few days on shipboard the weather had undergone a decided change; a feeling of fall, with winter at no great distance, had crept into the air. The sky was bright but cold northwesterly winds were our almost daily portion. On the morning of August 23, a cruise up the stream which enters the northerly end of the harbour was begun. Following the stream a short distance inland a point was reached where the natives had constructed a large stone fish-trap. Upon being overhauled it yielded fifty-four salmon. After walking for some hours, camp was reached at 10 p.m., all the salmon being brought home. It was found that eleven salmon make a man's load.

The morning of the 24th opened with high wind, rendering magnetic observations impossible, but during the day a trip was made westerly along the coastline, the harbour having been crossed by canoe. The country is of low limestone with very little rock in place. Some plants were secured and numerous old camp sites seen. The latter, were, however, productive of no results in so far as specimens of implements or other native products were concerned, as the camps were all located on barren ridges upon which no new soil had been formed and anything that may have been left there in times past had either been picked up by the natives or carried away by the wind. When returning to camp, we again visited the fish-trap, securing twelve salmon.



1. Native village on ice, Polly Bay, April, 1926. 2. On floor ice, Ross Welcome, looking for a lead, "June," 1926. 3. Netsilingmeut woman with native shovel, Boothia Peninsula. 4. One of the author's sleds on ice off King William Island, April, 1926.

WILD LIFE OF THE REGION

On the 25th, the sky was overcast, but otherwise the weather was much the same as on the preceding days. In the morning all hands left by canoe for a seal hunt, but the wind came up soon after, driving us ashore. The afternoon was spent taking a series of magnetic observations. The country is dotted with small ponds and lakes which appear to have been the breeding grounds of several varieties of ducks as every lake had flocks of young ducks just about ready to fly.

On the morning of the 26th the fish-trap was again visited, eighteen salmon being secured, while the afternoon was spent taking magnetic observations. During the evening the natives went out in the canoe and killed a half grown "oojook" (square flipper seal) which made an acceptable change from the fish diet on which we had lived since coming ashore.

During the morning of the 27th a trip was made westerly across country and about a dozen ptarmigan were secured, the afternoon being taken up with a trip south along the east side of the harbour. A headland on the south coast was visited.

On the morning of August 28 the fish-trap was again visited, thirty-six fine salmon resulting. The natives say that a little later in the season the fish will be much more plentiful. On the bank opposite the fish-trap the natives have brought a great many slabs of limestone with which they build fish caches. Teetapkoo had figured out just how long and how wide his fish cache would be before the freeze-up. If he carries out his program he and his family will certainly not be hungry during the winter.

Next day the weather was clear and fine. The morning was used to secure photographs and in a series of demonstrations by the natives Teetapkoo and Ooja of the now almost obsolete methods of securing fire without matches. A trip was made across the bay to the site of an Eskimo camp but the relics secured were all modern. The site of the winter camp used by Collinson during the winter of 1855 was also visited. The only indications of the buildings now remaining are the foundations of the house. Either the house was removed when the camp was vacated or the natives have taken the lumber for their own use.

On August 30 the natives went to the fish trap early, returning with sixty salmon. My time during the morning was spent in making magnetic observations and in copying Eskimo phrases. About midday two schooners, the *Fort McPherson* and the *Elsueno*, arrived. The *Fort McPherson*, a Hudson's Bay Company auxiliary schooner, left Bernard Harbour the same day as the *Baychimo* to proceed to King William island with supplies for a new post. It was returning to Cambridge Bay for another load and on the second trip we were to accompany it.

JOURNEY CONTINUED BY MOTOR SCHOONER

During the morning of September 2, Mr. Peter Norberg in his schooner the *Elsueno* sailed for Tree River and the opportunity was taken to send a last mail to civilization. Shortly after noon the loading of the *Fort McPherson* was completed and a start made for King William island. The weather was very fine and it was hoped to run day and night although the darkness would now last some hours. By 5.30 p.m. the boat was off cape Colborne with an ENE. wind coming up which meant head wind after rounding the cape. At 8 p.m., off Back point, the wind had by this time developed into quite a blow with the sky overcast and the light going fast. Shortly afterwards we ran into a nest of shoals which worried the skipper, so we turned into Anderson bay and anchored for the night.



1. Native igloo on ice off Boothia Peninsula, April, 1926. 2. The author at King William Island.
3. Seal camp on ice off Boothia Peninsula.

On September 3 all hands turned out on deck at 4.30 and got the boat away. By 1.20 p.m. the west coast of Lind island was reached, when the anchor was dropped. Ahead of us lay a long stretch of open water which the skipper did not care to undertake without plenty of daylight ahead. Some hours were spent ashore on Lind island, but no signs of native occupation or of wild life were observed. The island consists of several low, rolling, limestone hills with comparatively little vegetation and is useful only as a monument marking the western entrance of Queen Maud gulf.

The *Fort McPherson* left her anchorage at 4.45 on the morning of September 4. A northeasterly tidal current of about two and one-half knots was running. The Royal Geographical Society islands were reached at 10.40 a.m., when the course was changed to due south. This group of islands, extending approximately twenty miles east and west and fifty miles north and south, consists entirely of low, flat tables of limestone. Even before the group was sighted from the deck many reefs similarly formed were crossed, some rising to within six feet of the surface. The islands themselves appear to have only shallow channels between them, no channel for a boat drawing more than six feet having yet been located; in fact the whole of Queen Maud gulf appears to present a difficult problem in navigation. The Royal Geographical Society islands themselves are low and flat, no high land being seen except on an island lying far to the southeastern corner of the group which on account of its silhouette has been named Hat island. On the islands themselves are many small lakes and ponds with a fair proportion of the land area covered with grass. They should serve as a good breeding ground for certain types of waterfowl.

HAT ISLAND

At 3.40 p.m. the anchor was dropped off the easterly end of Hat island in a harbour well protected by reefs and small islands. Going on shore we found the island to consist of flat beds of limestone which rise to possibly one hundred feet in the centre, the land closer to the coast being low and flat. The whole island resembles in appearance a hat with a broad, flat brim. Caribou signs evidently dating from the previous spring were seen, as were many fresh fox tracks in the fine sand along the coast. Vegetation was not very abundant and life, with the exception of wild ducks, comparatively scarce. A few square flipper seal were seen at Hat island. Magnetic observations were taken. It should be remarked that the ordinary ship's compass does not work east of Coronation gulf but the fine trough compass supplied with the transit could be relied upon. Many signs of former native occupation were to be seen; stone caches, evidently for caribou meat, were numerous. The higher land appears to have been used as a burial ground. Among the specimens (anthropological) secured there were soapstone vessels and various implements of bone, stone, and native copper.

Hat island was left at 4.15 a.m. on September 5. Shortly after 3 p.m. a fog blew up from the west which shut out all our landmarks. Holding the course very much by guess, land, which proved to be the Hudson's Bay Company post on King William island, was sighted and about 3.30 p.m. the boat anchored in the harbour. The navigation of Queen Maud gulf will always present a problem, as at no point was any great depth of water found, while even when out of sight of land two fathoms was not uncommon.

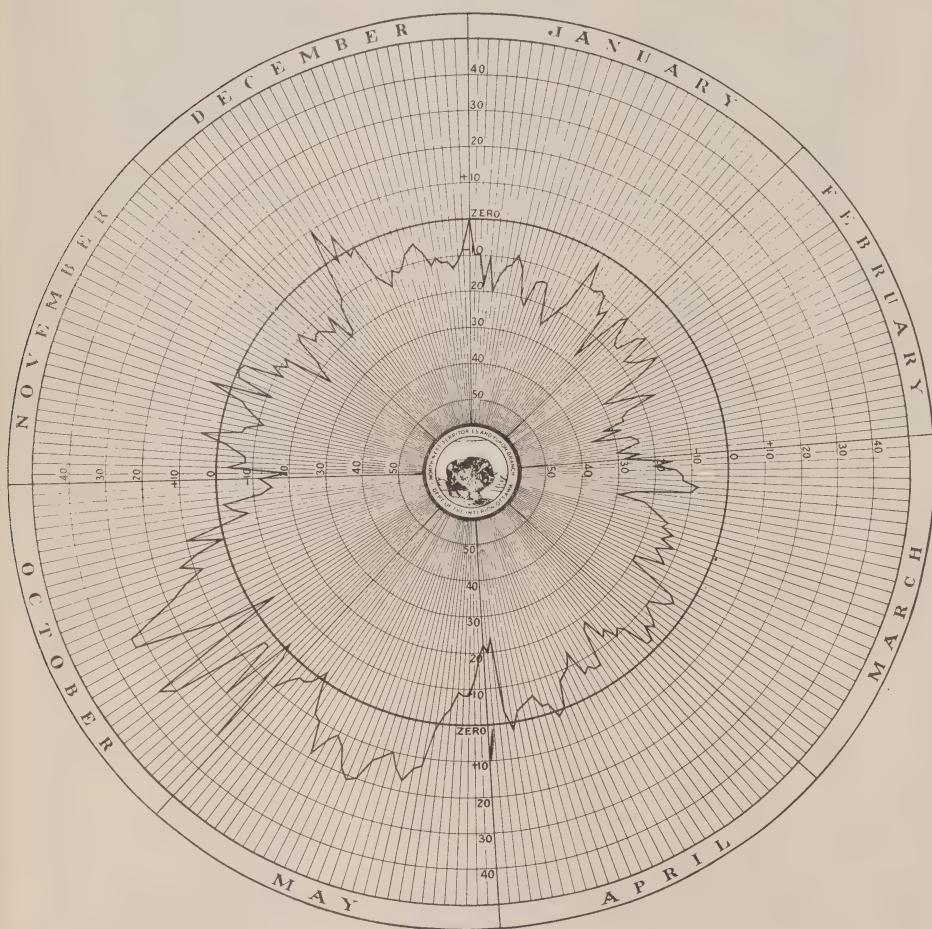
AUTUMN AND WINTER ON KING WILLIAM ISLAND

In recent years the natives have not used King William island as a summer hunting ground; Boothia peninsula, Adelaide peninsula, and the interior on the mainland south of Queen Maud gulf being more attractive fields. Toward the eastern end of King William island several streams flowing from fresh water

lakes are well stocked with fish but the absence of caribou would leave the Eskimos living there destitute of winter clothing. For many years past the local natives have not hunted sea life during the season of open water, a fact, no doubt, due to the uncertainty of summer ice conditions and the difficulty of securing wood and other material from which to construct seaworthy kayaks or boats.

TEMPERATURE CHART

KING WILLIAM ISLAND



Winter, 1925-26

DESCRIPTION OF KING WILLIAM ISLAND

The first impression given by the terrain of the coastline of King William island is one of almost complete desolation but this upon closer acquaintance gives way to some extent to a picture of many hardy forms of life in conflict with conditions that will try their every resource if they are to maintain an existence. On a land which at first shows little else but dead clay interspersed with drab and broken stone, varied by ancient sea beaches of clean-washed gravel, monotonous in their regularity, rough grasses and many of the hardier

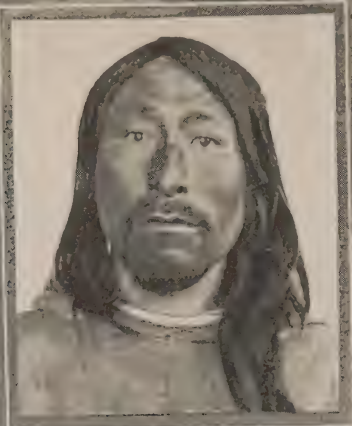
Arctic flowers seem to hold a lease of uncertain tenure. A closer examination reveals the fact that various forms of animal and bird life have at least held their own in what must always be a strenuous and daily struggle for existence. Lemming and fox, following their natural methods of securing a home and food, have maintained their footing during the entire year; caribou during the summer season only.

Many types of land and water birds visit the island during the short summer season but these find a home elsewhere during the harder winter months. Some of the streams and lakes contain several varieties of fish, while the salt water along the coast is well stocked with both fish and seal. When the coastline is left behind, the interior of the island presents a warmer and more hopeful picture. Vegetation is much more plentiful and vigorous, supplying a background which suggests animal and bird life in plenty. The country still consists of clay, broken stone, and washed gravel, but when the cold sea winds are no longer a factor, the hardy plant life of the north entrenches itself in all but the more exposed areas.

Traces of human residence are also to be seen—stone tupek or tent rings, meat and fish caches, and Eskimo graves, being evidences of many years of occupation by the native hunter. Of the graves scattered along the coastline a number are those of members of the Franklin expedition who perished in their attempt to reach civilization by way of Back river. The only other signs that were observed of the advent of white men consist of three cairns situated on headlands along the south coast of the island, one at cape Herschel (latitude $68^{\circ} 41' N.$, longitude $98^{\circ} 22' W.$) left by Simpson in 1839, one on a headland twenty miles east of cape Seaforth which was established by C. F. Hall about 1869 and the last on the eastern side of the entrance to Gjoa Haven, Petersen bay, marking the point at which Amundsen and his party wintered during 1904-05. Rasmussen, who reached King William island during the spring of 1923, built a Greenland "dugout" on the western slope of cape Seaforth, where the excavation, with its caribou skin lining, was still to be seen; while later during the same season Mr. Peter Norberg established a small trading post for the Hudson's Bay Company, which is still occupied. This post, at the time of our arrival, consisted of only two buildings, one a small store built of sheet iron, the other a double canvas house which was used as a residence.

Shortly after the schooner anchored in the bay opposite the King William island post, Mr. W. Gibson, the relieving agent of the company, and the writer took up quarters on shore, the others who were destined for a point on the south coast of Queen Maud gulf remaining on board. The first days after our arrival were spent in unloading the schooner, building caches—using lumber floors with canvas coverings—and in reloading the boat with an outfit with which it was intended to establish a trading post at the mouth of Perry river. It had been my intention to put up a double tent for winter, and for this purpose I had bought a small supply of rough lumber, but eventually this was used in the construction of the caches and an arrangement made for me to live with Mr. Gibson in the canvas shack already erected.

The weather during September 9, 10, and 11 was blustery with many snow flurries and the boat remained in port until the morning of the 12th, when the anchor was hoisted. The settlement of King William island had thus been reduced to Mr. Gibson and myself, no natives having been seen since the arrival of the boat. After the departure of the boat, the day was spent in hanging fish nets and getting them set, as shortly after freezing weather the fish would no longer come into the bay. On this day the temperature was already well below freezing with young ice forming on the salt water. On the 14th, four nets were overhauled, the yield being twenty-four fish. On the following day



1. Netselingmeut man, King William Island. 2. Neettayuk, Pelly Bay. 3. Netselingmeut boy, age six, King William Island. 4. Native type, Chesterfield Inlet. 5. Native woman, wife of Okalta, King William Island. 6. Netselingmeut man wearing native snow goggles, Rae Strait.

there was a high wind but the temperature did not go below freezing. For some days we were occupied with routine duties, fishing and putting everything in shape for the winter. There were some large salmon or salmon trout coming from the nets, the largest weighing possibly 30 pounds. On the 20th the stream entering the end of the harbour froze over and from this time on no more fish were secured from the nets. The total catch of fish, while enough for household use, in no way solved the dog food problem.

On the 21st the first excursion was made into the interior, a number of lakes eight to ten miles north being visited. Three caribou were seen. Another trip inland for about ten miles was taken next day but no caribou were seen; plenty of fox tracks everywhere, but no birds, the ducks having migrated some days before. During the day the wind came strongly from the southeast, followed by heavy rain, taking away what snow was still on the ground.

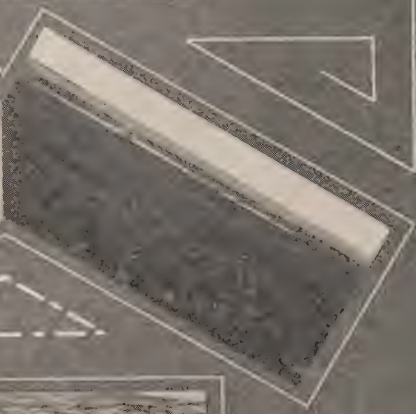
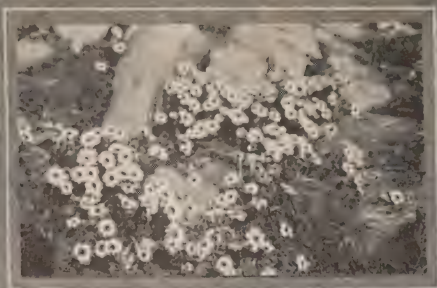
On September 26 a canoe trip was taken through the islands to the west. The weather was fine and a number of islands were examined, but beyond a few trinkets nothing was found. There were indications on all islands of caribou, all dating from the previous spring. During the afternoon a boat heading east was sighted, which proved to be the *Fort McPherson*. It transpired that during the two weeks which the boat had been absent those on board had encountered nothing but snow squalls and thick weather and were unable to reach the mouth of the Perry river. The enterprise of establishing a new post had been abandoned for the season and a decision arrived at to camp for the winter at King William island. This meant that the arrangements for the winter, which it had been hoped were quite complete, were not properly begun, as a new house was a necessity and some fifty tons of freight abroad the boat was still to be taken care of.

From September 27 to October 6 everyone was busy either unloading the boat or working on the new house. The weather was getting gradually colder and several wind storms with driving snow helped to delay operations. The temperature dropped each day, ranging from six above to eight below zero. On October 6 the first large flock of ptarmigan appeared, and a number were killed, and on the 8th two caribou were seen on a ridge about one mile from the buildings.

WINTER SETS IN

On October 12 another trip was made northwest from the post. The fresh-water lakes were all frozen over and remained so for the winter. The only life seen was one fox and many flocks of ptarmigan. The ptarmigan were all travelling south indicating that they would soon disappear altogether. On the 13th the salt water was freezing quickly. Ooja killed a polar bear a few hundred yards from the houses. October 14 came in with a strong northwest wind with the snow dry and flying in clouds. This was the forerunner of many blizzards which visited King William island during the following few months. During the previous night the ice had set on the straits and early on the morning of the 14th an Eskimo, his wife and two young children crossed from Adelaide peninsula. They reported the ice offshore as still very thin but returned to the Adelaide side to bring over their camp. The temperature in the early morning was six below but during the day rose to twenty above zero.

On the 16th the temperature had risen to plus 32, rain all day. During the forenoon enough ice was cut from a fresh-water lake to supply the house with water for the winter. The fresh-water ice was fourteen inches thick. October 17 was another warm day, plus 32 to plus 34. A trip was made easterly along the coast. Many old Eskimo caribou caches were found on the ridges but no



1. Arctic daisy (*Matricara inodara*, var. *grandiflora*), Chesterfield, July. 2. Hauling whale-boat over the ice, Repulse Bay, June, 1926. 3. Churchill flowers, August 10. 4. White whale, Chesterfield, August. 5. Native sled on snow blocks used for cache on ice, King William Island.

sign of life was seen on this trip. The native Ohokto who arrived from the south a few days ago said that the caribou had been fairly plentiful on the Adelaide peninsula side of the straits.

The temperature was still plus 15 on the morning of October 21. A trip was made due north for a distance of about fifteen miles and many small fresh water lakes were seen. The country is all very low, no hills rising more than about fifty feet. The only signs of life seen were fox tracks and several flocks of ptarmigan. Another native appeared during the day. He reported that he had spent the summer fishing on a stream on the eastern end of the island. He arrived overland and returned soon after to bring his wife and child to camp. He appeared to be practically destitute of clothes, the failure of the caribou migration having left those on the island without clothing skins.

During the following days the weather settled into its winter stride. The temperature dropped somewhat and strong northwest winds kept the air full of drifting snow until October 27, when, with the thermometer at zero the first real blizzard of the winter developed.

The weather became settled on November 1 and from that time till the middle of the month daily trips were made from the post in all directions, except on days when blizzards made this impossible. The temperature ranged from zero F. to 19 above. Old caribou caches were common but no caribou were seen. Foxes and owls were frequently noted and this was explained by the fact that lemming, on which they feed, were plentiful. The natives went to Adelaide peninsula to bring their meat supplies.

WINTER ROUTINE

By mid-November we had been settled in what may properly be called our winter routine for about thirty days. The time was spent, when weather conditions permitted, in making one-day trips in various directions from the post, the stormy days being used to work on sleds, dog harness, fur clothing, and on other necessary preparations. The short trips had a two-fold object; to learn everything possible about the country and to get men and dogs in condition for long and arduous trips, which they would be called upon to make later in the winter. The foregoing selections from the diary may be taken as a fair representation of the ordinary winter routine which lasted until the first long trip which was undertaken on March 2, 1926. As the detail of the daily routine for this interval will in no way add to the reader's knowledge of the life and conditions maintaining, the only incidents that are recorded for the following several months are those that are not in the nature of routine.

Up to November 12 the only natives seen were two families both of which had spent the preceding summer within a short distance of the post. The first to arrive, Ohokto and his wife and two children, had spent the previous three months on Adelaide peninsula, the other an older man with his wife and one child having summered on the eastern end of King William island where they lived on an unvaried diet of fish. Both of these families built permanent igloos close to the post, one, Ohokto undertaking the duties of post servant; the other electing to fish and trap in the vicinity of the post. It was not until November 23 that more natives were seen. On this date four families arrived, coming from the main sealing camp of the Netselingmeuts which was then located on the ice some miles south of Rae strait. These families had hunted on Boothia peninsula, near cape Britannia and reported a successful season with plenty of caribou and fish still in their caches. They stated that musk-oxen were to be seen on the peninsula.



1. Native type, Chesterfield Inlet, July, 1926. 2. Baker Lake native women, 1926.

GOOD CONDITION OF THE NATIVES

Physically all of the natives seen thus far were much above the average; muscular men and women, comparing favourably in stature with white men, with clear skins and clear eyes, every appearance of perfect health and with every confidence in their ability to garner from the country a living for themselves and their dependents. Mentally they proved to be much as other races, the wise, the commonplace, and the simple; this classification being entirely comparative, the wise being wise only in matters of moment to themselves, the simple being simpletons among a simple people. They are as yet practically untouched by civilization; their only school has been that of nature ruled by the sternest of masters—necessity, with a curriculum entirely devoted to domestic economy. In this school the clever have learned much, the commonplace just enough, while the simple graduates are the Eskimo equivalent of "hewers of wood and drawers of water." The glimpses of civilization so far permitted to these people have not yet stirred in them any ambition to achieve great wealth, the policy of providing against immediate necessity being considered sufficiently far-reaching. The only valuable commodity which they produce in any volume consists of the pelts of white foxes but in planning their winter campaign to secure these they appear to limit the prospective catch to just enough to secure their outstanding necessities, trusting to the surplus of seal, meat, or fish secured in the routine of their everyday life to supply a medium of exchange with which to meet their minor wants.

All natives seen up to this time appeared to know nothing of the Franklin party. They came from Boothia peninsula and were not of the tribes which saw the Franklin party on the march. The descendants of the King William Island natives, who did encounter this party on their last march, have all moved westward to the south shore of Queen Maud gulf.

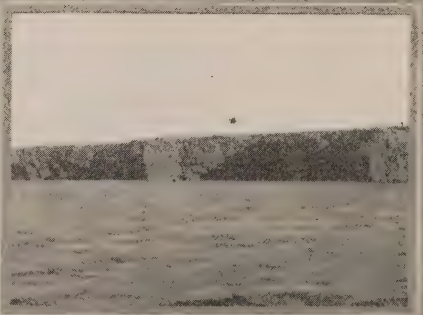
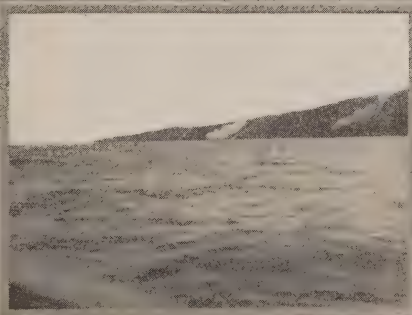
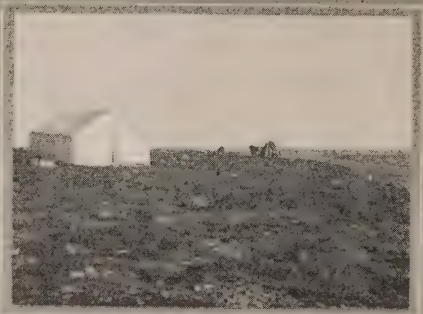
It was not until December 4 that the first natives from the westward visited the post. This party consisted of a young hunter named Ikalo (the fish) with his two wives and one infant child. They appeared to be quite the physical equals of the Netselingmeuts, having manifestly taken full advantage of the hard native training. In addition they were better developed mentally, having been more in contact with civilization. Their clothing showed more of a desire for ornamentation and their accoutrements, a much closer contact with the white trader. The hunting season had been spent far inland to the south of Queen Maud gulf but, while caribou had been plentiful, the major part of their hunt had been made so far from the coast that no great amount of meat could be brought to their winter quarters on the salt-water ice. The sealing had been very poor, leaving them almost destitute of fuel, while for food they had thus far depended on fish which were none too plentiful. Ikalo had, however, trapped a number of foxes, the pelts giving him the wherewithal to purchase his immediate necessities.

On the 10th, two young natives, little more than boys, arrived from the seal camp to the east, bringing frozen meat and fish for the use of several quite old natives who had taken up winter quarters near the post.

On December 14, daylight lasted about three and a half hours. Although the sun did not show above the horizon, for some time before and after noon the southern sky was filled with the most wonderful colours, red and old rose predominating. To the north the colours gradually changed to violet.

CHRISTMAS ON KING WILLIAM ISLAND

About December 1 Mr. Gibson, agent of the Hudson's Bay Company, accompanied by Ohokto, left by dog-train with the mouth of Back river as their objective. They returned to the post on the 20th, having reached and



1. Sled dog and driftwood, Inman River. 2. Trapper's camp, Inman River. 3. Rocky islands, five miles off Cape Parry. 4. Smoking hills, southeast of Baillie Island. 5. Keats' Point.

passed their destination. It had been hoped that natives would be found in that vicinity but the trip to the southeast side of Franklin lake and return was made without any result except the loss of two dogs and a great deal of discomfort. During the time they were away the temperature had been very low and the weather almost uniformly stormy. One or two abandoned igloos and the trail of an Eskimo sled were the only signs of local inhabitants. The only game seen was one caribou.

On the 22nd, the weather was still cold with high winds and flying snow, which in no way invited travel or outdoor work. Christmas being only three days away our whole community decided to devote the intervening time to the preparation of what limited festivities our resources permitted. Our stock of fresh food consisted of a few pounds of caribou meat, a few eggs, and ten pounds of potatoes, but of other provisions we had an ample supply and were thus enabled to provide a dinner on Christmas day which was a complete success. The day after Christmas the shortage of fresh meat and fish was relieved by two Netselingmeut natives who arrived from the isthmus of Boothia bringing a supply of both which they were glad to exchange for tea, sugar, tobacco, and other white man's commodities.

The continued storms had made a great difference in the appearance of the settlement; when the snow had drifted hard enough both houses had been built over with blocks until a wall and roof of about two feet in thickness covered the buildings; as the winter progressed the drifts around the buildings rose higher and higher until by Christmas a forty-foot tunnel with rooms cut on each side for the storage of coal and other supplies was necessary to connect the houses with the outside world. Of the lower house, the only indication showing above a field of level drifted snow was about one foot of stovepipe and the top of the ventilator. From the New Year until spring each succeeding storm called for a fatigue party either to clear the entrances to the house or to extend the tunnel to the open air until by April one tunnel had reached a length of eighty feet. It was also necessary to excavate openings to our window although by midwinter the amount of light thus admitted had, even at noon, to be augmented by lamps. About the New Year several more native families from the south coast of Queen Maud gulf arrived, bringing a fair number of fox pelts which were traded at the post.

THE SUN RETURNS

January 11 was a clear, cold day and marked the return of the sun. It was not visible from the coast but lighted the higher country inland for a few minutes at noon. No one who has not experienced the complete absence of sunlight for a more or less lengthy period can properly appreciate what this annual return of light and hope of warmth means to the people of the north.

Until January 27, the days passed without event. There was still much to be done to complete the preparations for the trips during the coming months. First, to build an igloo large enough to serve as a workshop for the assembling of a sixteen-foot sled and then much detail before a long trip could be undertaken. In this work both Angnowya and Angote, natives I had engaged, proved most efficient, everything being in readiness before the date set for our departure.

On the 28th a member of the crew of the schooner *Fort McPherson* left on a trip to the sealing camp to purchase dog feed and fresh fish for the post. He returned about two weeks later reporting a successful trip, having secured all the dog feed two teams could haul. He found the travelling conditions on the salt-water ice excellent and the natives at the large sealing village south of Rae strait prosperous and contented.



1. Royal Canadian Mounted Police dogs, Bernard Harbour. 2. Royal Canadian Mounted Police Detachment, Bernard Harbour. 3. Hudson's Bay Company house, Bernard Harbour. 4. Building used for two years as base of Southern Party of Canadian Arctic Expedition 1913-18. 5. Snowmobile, Bernard Harbour.

The following month passed without any outstanding event, much of the time being spent on the construction of a new sled and on repairs to another, the making of dog harness, and on the selection and repacking of a travelling outfit. Native visitors were numerous, many of them remaining some time in the vicinity of the post, during which time they augmented their food supply by fishing through the salt-water ice for tommycod. An examination of the holes cut for the above purpose showed the ice in Simpson strait to have a fairly uniform thickness of about fifty-eight inches.

On February 20, one of the post staff returned from a trip to Kent peninsula post. He had found a comparatively large native population scattered along the southern coast of Queen Maud gulf, all of whom he reported as being well provided with all necessities except dog feed.

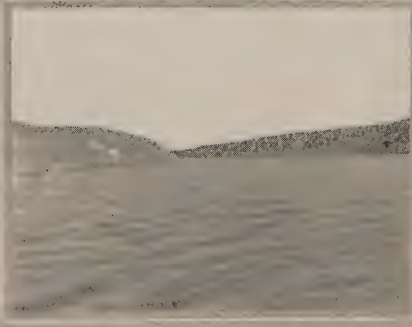
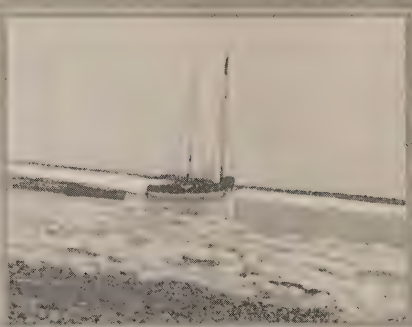
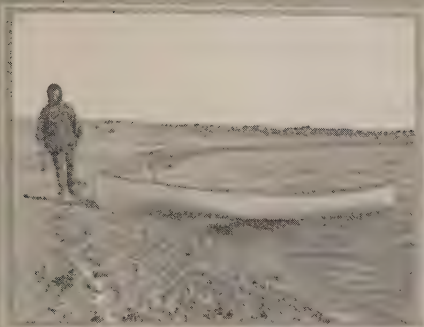
INSPECTING SEALING CAMPS ON THE ICE

March 2 had been set as the date of departure to visit the Netselingmeuts at their several sealing villages scattered on the ice between King William island and Boothia peninsula, and a start was made at 2 p.m. The expedition now consisted of two sleds, two natives, Angnowya and Angote, nineteen dogs and myself, a third sled with a part of our load having preceded us one day. Dog feed was most difficult to secure, only enough to feed the dogs twice being available. It had been hoped that the first sealing camp would be reached in four days, in which event this supply of feed for the dogs would be ample as according to authentic reports more could be obtained from the natives. The four days, however, gradually lengthened into nine before we reached our first objective. Angnowya had a caribou cached at a point along the coast, which helped to keep the dogs on their feet, but by the time the native camp was reached they were sorry-looking teams.

On this initial stage of the journey the first difficulty was a blizzard which kept us confined to our igloo from the evening of March 3 to the morning of the 8th. The temperature ranged from 24 below to 30 below. The ice shoeing of the large native sled became detached which necessitated a delay for repairs, another day was lost in recovering some necessary articles dropped from one of the loads. The dogs became so desperate from lack of feed that one night they raided the cache and destroyed ten pounds of rolled oats, some sealskin boots and fur clothing. It was a very trying trip.

A NETSELINGMEUT CAMP

Finally at 3 p.m. of the 12th the village of the seal hunters was reached. Here we found fifteen large igloos which housed the greater part of the Netselingmeut tribe. We were welcomed in the true Netselingmeut manner, the men first standing in a group at some little distance while the women of the settlement, who were mothers, each with a knife in her hand ran around our loaded sleds in a wide circle. According to their belief the track left by the women would encompass any evil spirits that had followed us across the ice, thus keeping them out of their settlement. After this formality had been observed, the men advanced to greet us and I, more or less automatically, undertook to shake hands but was stared at in blank amazement. However, Angnowya, whose month at the post had advanced his knowledge of white men's ways, explained to them that this was a white man's welcome, and the natives, who are always interested in anything new, then consented to become acquainted in a white man's way. As they showed every inclination to be most friendly and helpful, two circles indicating the size and position of the igloos we would like were marked on the snow and within an hour they had erected for us a large and fairly comfortable home. Our share in the proceedings was



1. Coast of Stromness Bay, southeast Victoria Island. 2. Schooner *Ptarmigan* at Cape Macready, September 10, 1929. 3. Eskimo cairn with musk-ox skull on top, Anderson Bay, southeast Victoria Island. 4. Southeast coast line, Victoria Island, September 7, 1928. Note last season's snow. 5. Square flipper seal, Cape Macready. 6. Northeast angle of Anderson Bay.

now clearly indicated so the primus stoves were lighted and kettles of tea and rations of hardtack produced as quickly as our domestic arrangements would permit, after which everyone was given a pipeful of tobacco. As some of the natives met had visited the post during the earlier part of the winter we were not among entire strangers, but to others and more especially to the children a white man was a decided curiosity.

The men informed us that they seldom used their rifles on the fall caribou hunt as the deer could easily be killed with spears while they were fording the streams or lakes. Many of the men, although possessing a rifle of sorts, were still equipped with bows and bear spears with which they said, should their ammunition fail, they could support themselves. No difficulty was found in purchasing seal, frozen fish, and rancid caribou meat, so the famine amongst our dogs was for the time ended.

The village in which we found ourselves was the fourth of a chain that had been built by this band, the others, as the sealing failed or better locations were found, having been abandoned. These natives had spent the winter in the usual uneventful way and had met with fair success in their hunt, securing enough seal to provide oil for their lamps but much of their food had been drawn from their meat and fish caches located on Boothia peninsula. Many of these caches had been built shortly before the freeze-up when both caribou and fish were plentiful.

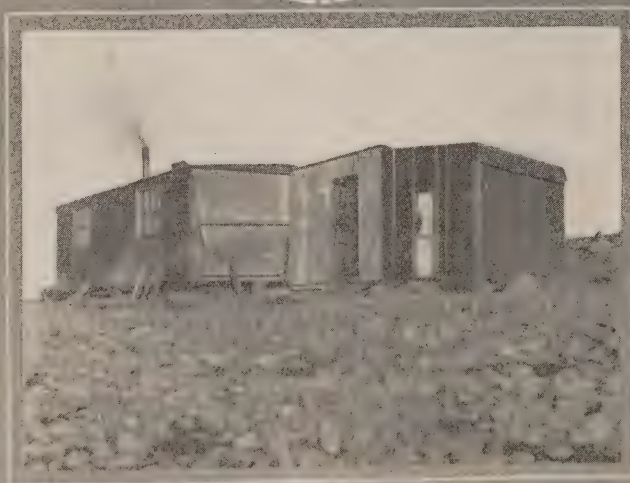
A WEEK WITH THE SEAL HUNTERS

A week was spent in this settlement, the ordinary daily routine of the native being followed as far as it was possible. At daylight the hunters would scatter over the ice accompanied by a dog on a leash whose duty it was to locate the seal holes. When one of these was located it was first carefully examined, a long slender probe made of caribou horn, or should the hunter be more advanced, heavy iron wire, being used to locate the exact centre of the opening in the ice which lay two or more feet below the surface of the snow. In this operation great care must be taken not to disturb the snow more than is necessary as any unusual amount of light would spoil any chance of the seal using that particular breathing hole. Each seal keeps a number of these holes open and appears to visit them more or less in turn. After these preliminaries are complete a wind-break is built of snow blocks and the hunter takes up his position, his spear always in readiness to await the coming of the quarry. This may involve a wait of minutes or of many hours and it is here that the Eskimo is schooled in the patience that makes him and his fellows kings, even among the more patient people of the world.

As the light began to fail a general movement towards the village would set in, those that had been fortunate laboriously dragging their seal, the others in no way downcast, planning another day and better luck. Upon their return each hunter reported at our igloo where he was given a mug of tea and a biscuit.

During the evenings as many as could crowd into our quarters presented themselves and were made happy with tobacco, their contribution of the evening being tales of the country and its people. From these people I learned much of the detail of the ship which is reported as lying under water on a reef off the east coast of Matty island and which can scarcely be any other than one of those abandoned by the Franklin party. They all agree as to its location and appearance and state that the coastline in its vicinity has long been productive of both iron and wood.

The commercial phase of my sojourn at this settlement consisted in the purchase of dogs, dog feed, harness, fur clothing, boots, specimen native imple-



. 1. Native group, Perry River. 2. Native owned house, Perry River, Queen Maud Gulf.

ments, and curios. In trade the Netselingmeuts were not above what must be considered sharp practice but their efforts in this direction were anything but clever, consisting as a rule of an effort to collect twice for one article or of a request for payment for service or goods not delivered. Exposure of these attempts did not appear to arouse any mental perturbation, they accepting their defeat as one who has done his best with no success.

Upon inquiry it was learned that two other smaller communities were camped, one to the south near cape Britannia and the other in the vicinity of Rae strait. No recent communication had been had with either of these villages so their exact location was somewhat in doubt. It was decided to push on to the mainland of Boothia peninsula and to establish a cache of dog feed and other necessities at some point inland from the mouth of Murchison river where it would be of use on the trip from King William island to Repulse bay. A native named Nelle-i-you-too, who had hunted and fished on the Murchison river during the preceding fall, was willing to sell both caribou and frozen fish which he had cached at a point on the river known as Kogmatelle, so he and his dogs were added to our party and the Netselingmeut village left behind on the afternoon of March 19. It had been decided to follow the line of abandoned villages which would bring us ashore at a point some miles north of the mouth of Murchison river, but this route was considered preferable as the direct route was said to be through rough ice for the greater part of the way. Starting late in the day, it was already dark when the first abandoned village was reached, the distance travelled being not more than eight or nine miles. This was really much too close to the inhabited village as, unless restrained, the recently purchased dogs would undoubtedly return to their former owners. The best that could be done was to barricade them in a deserted igloo with the hope that a heavy supper would incline them towards sleep rather than towards their friends. Morning showed that we were to be disappointed by one member of our team. He had burrowed his way out and was not seen again until our return to the village where he and others of the canine population added to our welcome.

Breaking camp at 10 a.m. on the 20th, seven hours were spent on the trail, one deserted village being passed without a stop, our night camp being made in the second. Some trouble developed in making use of these old camps as at the time their builders left them many fox traps had been set which, while they did not appear to have gathered many foxes, were much more fortunate with our dogs.

BOOTHIA PENINSULA

Five hours on the following day brought us to the coast of Boothia peninsula and gave us our first close view of terra firma in eighteen days. Life on the sea ice had differed but little from that ashore, the only disturbing incidents being the groaning and the cracking of the ice when abnormal pressure, due either to tidal currents or wind, developed. Our landing on Boothia had been made at the fall rendezvous of the native hunters returning from the summer hunt and from which point the community leaves the land and takes up its winter quarters on the ice. Here we found only one large igloo which must have housed not less than seventy-five people. It had the appearance of having been developed piecemeal as the hunters with their families congregated, each newly arriving band building against the structure already on the ground and afterwards cutting out the wall between the old and the new. The total length of the igloo as we found it was about sixty-five feet, with a breadth of twenty-four. As it was impossible to heat so large a building one corner was walled in and a comfortable night spent.



Perry River natives, photographed during September, 1928.

In the morning of March 22 two hours' travel in a southerly direction, during which time we paralleled the coastline, brought us to the mouth of Murchison river, the trail then turning gradually to the east as the river was ascended. A cascade occurs at a point about fifteen miles from the river's mouth which marks a fishing ground favoured by the natives during the early fall. The meat and fish we were taking over from Nelle-i-you-too being cached at this point we decided to camp and there to locate the cache of supplies to be used on the trip from King William island to Repulse bay.

During the night the weather, which had been bad, became decidedly worse. As we were, owing to the days lost during the earlier stages of our trip, behind our schedule, work was continued until our cache was complete, the storm drifting everything full of snow before it could be covered. One large caribou and about eight hundred pounds of frozen fish were secured, part of which was added to our cache, the balance being taken to King William island.

MURCHISON RIVER

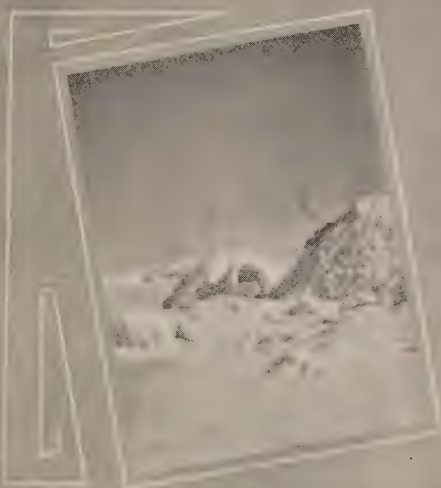
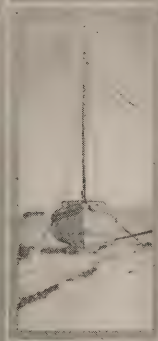
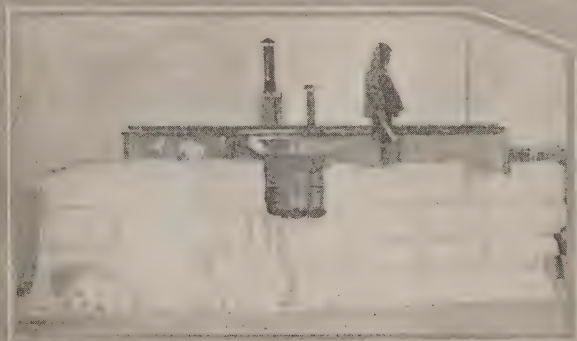
The section of the western coastline of Boothia peninsula visited by us was of the same formation as King William island, consisting of limestone and clay with comparatively little rock in place showing. In the vicinity of the mouth of Murchison river large sand flats are found with drifted sand covering sections of the sea ice, this drift in places being heavy enough to give the impression of sandbars. The entrance to the salt-water inlet into which Murchison river flows is concealed behind a group of low islands and may easily escape notice unless the landmarks, which are none too conspicuous, are known. Eight miles up the Murchison river the formation changes to Archaean, the country rock consisting of gneiss with much rock in place exposed, the cataract at Kogmatelle (the point at which we had cached our supplies) resulting from the narrowing of the river's channel between massive rocky banks. The river itself is not navigable even for small canoes, the wider stretches being so thickly filled with boulders as to permit of an easy crossing by stepping from stone to stone.

The surrounding country is, in season, most bountifully supplied with both fish and caribou, in addition to which musk-oxen are occasionally seen. As a fur area, this country can be said to be almost unexploited but the indications of white fox were more plentiful than in any other part of the North visited. Lemming were plentiful and the first warm sunshine brought out many ground squirrels (*Citellus parryi*).

At the time of this visit to Boothia no signs of the forerunners of the spring caribou migration were seen. On the morning of March 24 the sleds were loaded with a light travelling outfit supplemented by a supply of frozen meat and fish for use at the post and we turned towards King William island.

On the way we visited the sealing camp where we had stayed on the way eastward and found that about half of the natives had gone to a new sealing camp near Hovgaard islands and others to Rae strait. We accordingly journeyed the next day to the former place. Here the hunting had been good so we secured three additional seal, which with our other supplies we freighted to King William post where we arrived on March 30.

All of the dogs had quite recovered from the effects of short rations during the early stage of the trip and appeared to be in fine fettle, but the first news that greeted us on our return was that an epidemic of dog sickness had made its appearance, having already claimed a number of victims. It was decided to re-outfit with all speed and get our teams out of the post as quickly as possible. Much, however, had to be done before the equipment and outfits were ready for the trail and it was not until April 5 that a start could be made.



GJOA HAVEN, KING WILLIAM ISLAND—1. Eskimo with wooden leg. 2. Native igloos, November, 1928. 3. Covering winter camp with snow, November, 1928. 4. Schooner *Ptarmigan*, November, 1928. 5 and 6. Native camps, December, 1928.

KING WILLIAM ISLAND TO REPULSE BAY

At eleven o'clock on the morning of April 5 we said goodbye to the people at the King William Island post and started on the long trail to Repulse bay. This was the great sled trip of the whole investigation. The total distance was about 475 miles but, as owing to difficulties encountered much of this had to be gone over three times and a smaller part five times, the actual distance travelled was much greater. Bad ice conditions, continual storms, and the effect of the prevailing epidemic of dog sickness combined to make travelling painful, difficult, and slow, so that it was not until May 18 that we reached the trading posts at Repulse bay. Our chief difficulty was caused by the epidemic among the dogs. We hoped to escape this by an early start from King William island, but the next day two dogs died and from then on until nearly the last stage of the trip this reduction of our motive power militated against progress. It did this in several ways. Deviations from our course were made to endeavour to secure dogs, the loads had to be reduced to the minimum, thus leaving supplies that would have been useful later on, even the dogs which recovered were so weak that they could pull only part of their usual loads, so that again and again the supplies had to be relayed, involving many extra miles of travel and reducing progress at times to four or five miles per day. Blizzards held us in camp when supplies were low and when every desire and need was to get forward. Inability to get seal oil at a particular juncture and the loss of several gallons of coal oil through the failure of a container put us in dire straits for fuel, so that for the latter half of the journey we were reduced to one primus stove, and that used only for melting snow for drinking water. This also added to the delay by necessitating the cutting through five feet or more of ice to get water that we might not use up our few remaining pints of oil before we reached Repulse bay. On some occasions the combination of cold and high wind made travelling dangerous and the author was frost bitten in seven places, including both fore-arms, and the Eskimo helpers were also frozen. As Repulse bay was neared the bright sun on the snow and, even worse, the bright haze caused snow-blindness, so that for the last few days before reaching the posts all were practically blind and suffered many bad falls in consequence.

HOVGAARD ISLANDS

The first point touched on the journey to Repulse bay was the sealing camp at Hovgaard islands. Gjoa Haven was passed on the second day and the sealing camp in Rae strait on April 8. Following that a start was made toward the magnetic pole, distant only about two days' travel, but owing to the state of the dogs this was given up and a direct line made for the cache established on our previous journey. Kogmatelle was reached on April 17. Several Eskimos were met who agreed to go with us as far as Pelly bay. The loads were lightened at Kogmatelle, but in spite of this the plan of dividing the loads and taking them forward a half or a third at a time had to be adopted soon after, with the result that our schedule of progress was very much cut down. At this point in the journey we saw several bands of caribou.

On April 22 we passed along the southern boundary of an area that was undoubtedly an ancient seabed. Cut banks along the river showed a cross-section of fifty feet in depth consisting of a light blue clay which had become quite hard and which was filled with sea shells. This formation continued about seven miles along the river bank and apparently extended some miles to the northward. The formation of the rest of the country along this section of the river was Archæan, the hills being low and the watercourses wide and flat, the whole having been subjected to very heavy glacial action. As we proceeded



Native types, Cambridge Bay.

inland vegetation became more plentiful, the river flats and lower plateaus being covered thickly with a coarse grass, patches of moss, and heather, with occasional willows. Simpson lake was reached on April 24. Here the country is rolling, with gravel hills, some igneous rock showing in places.

It was at the end of April that our supplies of coal oil ran so low that we were reduced to one primus stove. Thenceforward when blizzards made travelling impossible the day was spent in bed to save fuel.

Upon leaving lake Simpson the course was shaped to the northeast over hills much higher than previously seen. On May 2 the advance toward Pelly bay was continued. Following a narrow stream, which falls rapidly over a series of cascades, we reached a larger stream which comes in from the north. This in turn ran into a wide valley which was followed east for seven miles, when salt water at Pelly bay was reached. Simpson peninsula was in sight from the high land and many islands were seen to lie in Pelly bay, the most notable being one known as Akovoliiguak, so named from its resemblance to a right whale. It is from this island, the outstanding landmark of the district, that the local natives take their name.

PELLY BAY

Upon reaching Pelly bay, where a number of natives were met who were then at a sealing camp, final arrangements were made for the continuation of the journey to Repulse bay. The course was now shaped to the southeast across the frozen surface of Pelly bay and the shore of Simpson peninsula was reached on May 8. Deep snow and blizzards made travelling laborious and it was not until May 12 that camp was made on a ridge toward the eastern shores of the peninsula.

The formation of the country from Kogmatelle on the Murchison river to this camp has been of rough igneous rocks, both sides of Pelly bay being rugged and comparatively high. A limestone area crosses the southern end of Pelly bay and continues east and west, the eastern extension reaching Committee bay. A considerable part of the area charted as water at the southern end of Pelly bay is in reality a low-lying, limestone country with the higher Archaean hills visible farther to the south which have manifestly been mistaken for the southern coastline of the bay. Limestones reappeared about half way across Simpson peninsula, the country consisting of wide level stretches well covered with grass with an occasional low gravel or limestone ridge striking north to south.

No caribou were seen on Simpson peninsula but occasionally the tracks of small bands were crossed. Fox signs were not so plentiful as on Boothia but ground squirrel abounded throughout the limestone areas. Several of the streams entering Pelly bay are well stocked with fish, some of which, in appearance, much like a lake trout, grow to a great size, sixty pounds not being uncommon. The native reports would indicate that later in the season a great number of caribou pasture on the eastern side of Simpson peninsula. They report also that the land on the western side of Committee bay has for many years been the range of a number of musk-oxen.

COMMITTEE BAY

On the morning of May 14, the weather had cleared and the temperature risen to above freezing. At 4 a.m. we broke camp heading southeasterly and after ten strenuous hours in the soft snow reached the shore line of Committee bay where we were glad to camp for the night. The aneroid indicated a drop of three hundred feet between this camp and the last but as atmospheric conditions were changing constantly, this reading may be far from correct. It is



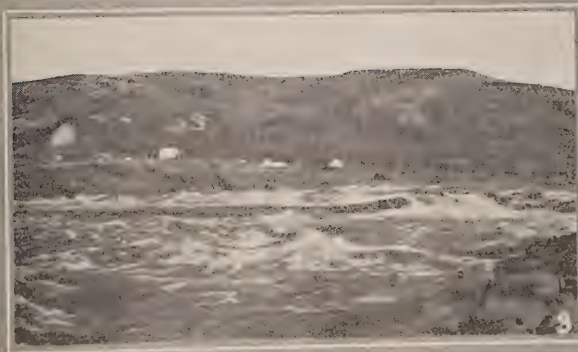
IN THE COPPERMINE VALLEY—1. Native group, Bloody Fall. 2. Kakooktoo, Koodlookta, Ikale, and Luke; copper nugget in left foreground. 3. Noon camp. 4. Koodlookta cooking, using heather for fuel.

certain, however, that throughout the day a series of plateaus was crossed, the elevations decreasing as the coast was approached. This last day had seriously affected the eyes of all of the party, all of whom had already been suffering in this respect. The fine weather on the 14th had led us to hope that the storms were, for the time at least, over but the early morning of the 15th disillusioned us as we awoke to the music of a heavy blow from the northwest. Fortunately our next course lay east of south, which placed the storm behind us, so in spite of the fact that we were certain to get our clothes and bedding very wet we decided to push ahead.

Following the western coast of Committee bay over smooth ice, which had been blown free from snow, fast time was made throughout the day. About twenty-five miles south of our night camp igneous rocks reappeared on the coastline. This formation continued until Repulse bay was reached. Towards evening the ice conditions changed from perfect to quite rough with deep fresh snow, the temperature being too high to allow the day's drift to pack. A camp was made in an abandoned native igloo which marked the trail of the Akovoligjuakmeuts *en route* to Repulse bay.

The condition of the party at this stage of the trip, while not critical, had reached a point where it might easily become so, the chief threats coming from the condition of our eyes and the serious fuel shortage. This last, however, was not the problem it would have been at an earlier stage of the journey as only a serious fall in temperature could make it dangerous. We did what we could to relieve our eyes by in turn holding to the back of a sled, meanwhile walking with our eyes shut, but as this sooner or later led to a bad fall not a great deal of relief was possible.

We were again on the trail at 2 a.m. on May 16 with the storm blowing even more strongly than on the preceding day but we felt that we had reached a point where the best policy would be to push ahead in spite of weather conditions, the post at Repulse bay being not more than one hundred miles distant. Near the foot of Committee bay we found two native families encamped, they having decided that the weather was too rough for travel. We spent an hour in their igloos and then pushed ahead hoping to reach the northern end of the portage across Rae isthmus by night. The trail, however, proving to be very rough with much soft snow, evening found us still six miles short of our objective. Here we again camped in a deserted igloo. The natives passed during the day were members of the Akovoligjuak settlement returning to their own country from Repulse bay. These people purchase no foods from the traders, depending entirely upon the country for their subsistence. Their spring diet consisted almost entirely of ground squirrels of which they had secured an abundant supply on Rae isthmus and plenty more awaiting them on Simpson peninsula. The average catch of white foxes in the Pelly Bay district for the preceding winter had been about ten for each hunter, three hundred in all being secured. It should not, however, be inferred that the country is lacking in fur, the comparatively small catch indicating rather that by far the greater part of the season was spent in securing food and fuel, the taking of fur being only incidental to their ordinary routine. By the morning of the 17th the wind had gone down but the country was lost in a heavy white mist which was a greater menace to our already almost useless eyes than even bright sunlight. Getting away from camp at 4 a.m. the land at Rae isthmus was reached in two hours. For some five miles we travelled easterly but from here our course lay to the south first across a wide grassy flat which constituted the delta of a stream entering Committee bay at this point and then a short distance up the watercourse to a point where our trail climbed steeply several hundred feet to a grassy plateau which was



IN THE COPPERMINE VALLEY—1. Clay hills, 300 feet high, near Bloody Fall. 2. Glacial drift with copper nugget on top, Husky Creek. 3. Foot of Bloody Fall. 4. Fish house.

dotted with ponds and small lakes. After travelling twenty miles at this elevation in a southerly direction a camp was made in an old igloo. During the forenoon we had passed one more native family headed for Pelly bay.

THE ARDUOUS LAST STAGE

On May 18 a very early start was made as it was hoped that a forced march would bring us to salt water and to within an easy run of the trading posts. During the early part of the day our trail dropped from the high plateau country to a chain of long narrow lakes which were followed throughout the rest of the day. On these lakes and their connecting streams water was beginning to show on top of the ice, a fact which enabled us to dispense almost entirely with the use of fuel. A short stop was made at each of the two native camps which were encountered along our trail. They reported themselves as three days out from the trading posts but as they move very leisurely this did not necessarily mean any great distance. It was their intention to remain where we saw them for several days during which time it was hoped to secure enough meat, chiefly ground squirrels, to ration them across Committee bay. After having travelled fifteen hours with the coastline not yet in sight we built a rough snow-and-canvas shelter where we spent the night.

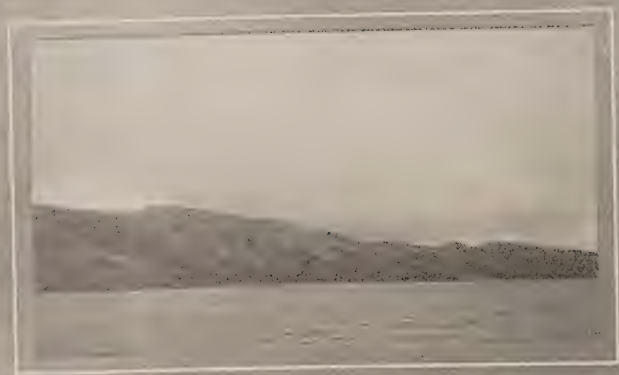
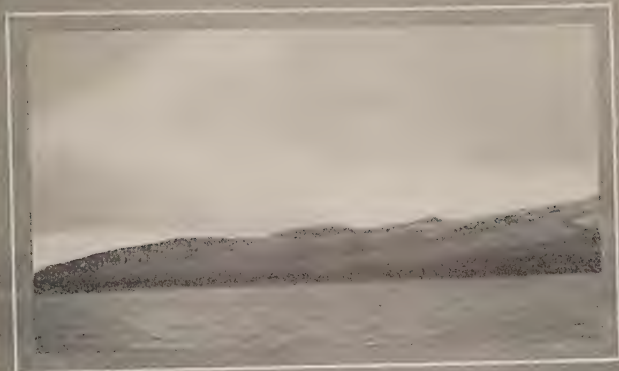
Our next day started at 3 a.m., the air being still and the temperature fairly high but everything was enveloped in a white mist. Everyone was to all intent and purposes blind, the white glare causing our eyes more than a little pain, so we decided that this should be our last camp before the trading posts were reached even if we found it necessary to travel throughout the next night or to abandon our loads as these could be quite easily salvaged later; neither of these more or less extreme measures were, however, called for as the posts were reached at 3 o'clock in the afternoon. Here we were most kindly received by the agents of both the Hudson's Bay Company and Revillon Freres, who have posts at this point.

During the last day of travel our trail lay along the chain of lakes which had been our guide on the previous day. This watercourse discharges into the extreme westerly end of Repulse bay, a small rocky hill immediately adjoining its mouth on the north being the site of the winter quarters used by Doctor Rae of the Hudson's Bay Company more than seventy years ago. The stone foundations of his building are still intact.

REPULSE BAY, CHESTERFIELD, AND OTTAWA

The country around Repulse bay consists of bold hills of igneous rocks between which lie grassy valleys, the hills are rugged and rise to a considerable height behind which lies a series of high plateaus. The limits of navigation of the waters of Repulse bay, Frozen strait, and Roes Welcome cannot with any certainty be defined, as heavy floe ice is never very far distant and a combination of wind and tide may at any time block the harbours and bays. The posts are the trade headquarters of four distinct groups of natives. The Akoviligjuameuts from Pelly bay, the Ivilingmeuts, who are natives of Repulse bay, the natives from Lyons inlet, and a more northerly group based on Iglulik at the southern end of Fury and Hecla strait. The hunting grounds of all of these bands appear to be fairly productive, cases of distress being uncommon, although occasionally the Iglulik people, when travelling northward, have suffered from famine.

Within a few days, the greater part of which was spent indoors, my eyes became more or less normal again, and arrangements for continuing the trip to Chesterfield inlet were commenced.



Views of copper-bearing hills, Bathurst Inlet.

TRAVEL BY WHALE BOAT

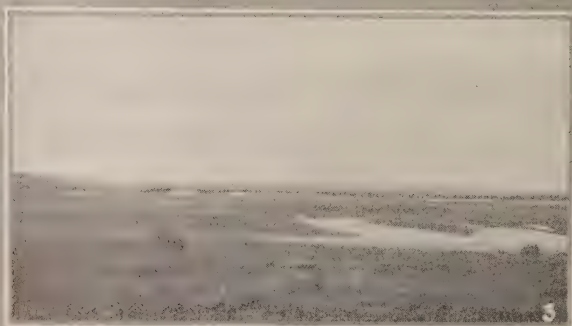
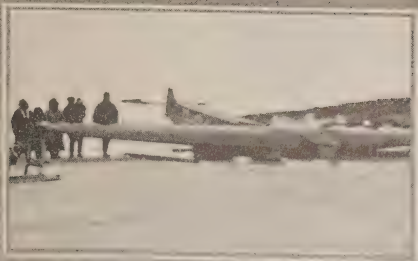
It had been my intention to travel by dog team and to follow the west coast of Roes Welcome southward toward Chesterfield, but, acting upon information received at Repulse bay, I changed this plan for a voyage by whale-boat with a native crew. It was declared this was the better and speedier way, since the mid-channel through Roes Welcome would be found open. Accordingly on May 31 a whale-boat owned by one of the natives was arranged for, along with a crew of three men. The boat and supplies were loaded on a large sled drawn by twenty-nine dogs and a start made across the ice toward a chain of small islands lying off Beach point, where it was hoped to find open water. However, the channel at this point was choked with ice so that it was necessary to proceed over very rough ice some distance further. It was not until noon of June 2 that the boat was finally launched. The extra man who had been brought to look after dogs and sled took these back to Repulse bay. At this time the first heavy migration of ptarmigan was witnessed, many hundreds passing to the north en route to their breeding grounds on Melville peninsula.

There is a heavy tide here and progress down the coast was made by taking advantage of it, by hoisting the sail when the wind was favourable, and by using paddles when both failed. Owing to the high load we carried oars could not be used. As there were long hours of daylight and as progress had to be made when wind and tide served and when openings in the ice-packs permitted, a good deal of the journey was made at night. Frequently our way was completely blocked by ice-packs and it was frequently necessary to haul the whale-boat out on the ice and to launch it again when a new lead opened. When thus held up by ice-jams we put up our tent on the ice and camped till the way was clear again. For most of the time we were out of sight of land as the channel was frequently fifteen miles or more from shore and at even the shorter distance the shoreline was hidden by the height of the floe-ice between us and the land. Some herds of walrus were seen but were not molested. As we were much longer in reaching Chesterfield than we had anticipated, our supplies ran short and several seals which were secured by one of the natives formed a welcome addition to our larder.

DEPOT ISLAND

The Royal Canadian Mounted Police camp at Depot island was reached on June 15, this being the first time in sixteen days in which we had stood on dry land. Some food was borrowed from the police and six days were spent at this place, the time being chiefly occupied in the examination of old Eskimo buildings. The foundations of old stone igloos were excavated in the search for relics and a number of photographs taken of the country and people. On June 21 in company with two Royal Canadian Mounted Police boats, a start was made for Chesterfield, which was reached without incident at noon on the following day.

During the trip from Repulse bay little was seen of the coastline, the only camp on land being made at Depot island. Where the coast could be seen the country appeared to consist of comparatively low hills with much igneous rock exposed. From a distance these appear to be barren, but, on our one visit to land, it was found that the valleys were well covered with grasses. No doubt this condition maintains along the greater part of the western coast of Roes Welcome. At the mouth of Wager inlet where we followed closely to the coastline many tracks of caribou were to be seen in the snow lying on the hillsides and the natives stated that this was a good hunting ground. As Chesterfield inlet is approached, the hills become much lower until the country appears almost flat but the geological formation is unchanged. The



AT BURNSIDE RIVER—1. Plane through the ice. 2, 4, and 5. Views of Dominion Explorers' base.
3. Delta, Burnside River. (Note sand flats which afford good landing for aeroplanes.)

waters of Roes Welcome were well stocked with sea mammals, several herds of walrus being seen and square flipper, harp, fresh-water, and jar seal fairly plentiful. The natives reported that later in the season many white whale would be found and that, when the shore ice leaves, fish would be plentiful in a number of the tributary streams.

CHESTERFIELD

Chesterfield at the time of our arrival consisted of a Royal Canadian Mounted Police post, sub-district headquarters of the Hudson's Bay Company, and a Roman Catholic mission, but no permanent Eskimo homes. Rt. Rev. A. Turquetil, Bishop of Hudson's bay, makes this his headquarters.

The country within a radius of fifty miles of Chesterfield is not overly productive of either fur or caribou, this settlement being chiefly used as a base for the several outlying posts that surround it, two of which are located on Baker lake, one on Kazan river, one at Eskimo point and one at Wager inlet. The caribou migration follows a line paralleling the coast and lying from fifty to one hundred miles inland. The sea is not too plentifully stocked with sea mammals or fish but they are present in sufficient numbers to meet the needs of the local inhabitants. Chesterfield inlet was not a centre of native population prior to the advent of white men, but their coming has attracted a number of families who now work with this point as their base.

RETURN TO OTTAWA

Passage from Chesterfield was secured on the Hudson's Bay Company's ship *Bayrupert* and on August 8 we sailed on the ship's regular voyage through the bay and strait on the way back to civilization. Ottawa was reached on October 10, 1926.

PART II

INVESTIGATIONS, 1928-29

INTRODUCTION

On June 29, 1928, the writer was detailed by Mr. O. S. Finnie, Director of the North West Territories and Yukon Branch, Department of the Interior, to make explorations and investigations in the Arctic Islands Preserve, via Aklavik, for one year at least, or for a longer period if necessary, with the particular object of securing information bearing on the living conditions of the Eskimos in that area as affected by the fur traders, the white trappers, the game migrations, and the various missions, and as to the best methods of safeguarding and improving the living conditions of the natives; to investigate general conditions as opportunity offered along the route from Aklavik eastward, but to proceed without undue delay to King William island, the centre of the area it was particularly desired to investigate; to ascertain the feasibility of motor transportation from Wager inlet to Back river, and of other routes in that region; to investigate and make notes upon the topography, magnetic declination, geology, plant life, ethnology, and all other aspects of the North that might present themselves; and, in the event of returning to Ottawa via Chesterfield inlet, to ascertain the progress of the mining activities in the area south of that waterway.

Acting under the authority of the foregoing the writer left Ottawa immediately and proceeded via Edmonton, Alberta, to Aklavik, Northwest Territories, which point was reached on July 31.

EASTWARD FROM AKLAVIK

Aklavik is at the present time the northern terminus of the Mackenzie River transportation system. It is a comparatively new settlement but it has developed quickly and has to-day the largest white population of any of the Mackenzie settlements. In addition to being the most northerly point served by the river boats, it is the northern terminus of the air mail system. A post office, with a money order service, has been established which serves this area and the adjoining Arctic coastline. A wireless station, Royal Canadian Mounted Police headquarters, two missions, each with a hospital in connection, and a number of trade stores complete the list of public services.

When the writer reached Aklavik, the Department of the Interior gasoline schooner *Ptarmigan* was at anchor and available for the continuance of the trip to the eastward, and supplies necessary to support an expedition for two years had also been delivered. Three days were then occupied in rigging the schooner, overhauling the engine, and stowing the outfit aboard, and with a crew consisting of one white man and an Eskimo boy the start was made on August 3.

Considerable time was spent in exploring the delta of the Mackenzie to find a water route by which river steamers might reach a point where direct connection could be made with ocean-going craft. It was August 9 before the south end of Richards island was reached. Here camp was made for the night in a vacant cabin.

August 10 was a perfect day. By noon the schooner lay five miles northwest of the settlement of Kittigazuit but owing to the difficulty in locating a channel leading ashore, this port was passed without stopping. The shallows formed by the alluvial deposits made by the Mackenzie river across its mouth extend some miles north of the northern islands of the delta and from Shingle

point on the west to cape Dalhousie on the east. Great care must be taken in navigating these waters as not only are there many miles of mud flats covered with from four to six feet of water, but the water level is subject to rapid changes, being influenced by the prevailing winds.

After passing Kittigazuit a course was laid to the harbour of Tooktoajuak, where we dropped anchor at 7 p.m. for the night. Here there is a small native settlement. There are very good fisheries both in the salt water and in the fresh-water lakes lying to the northwest. The bay between Dalhousie and Hendrickson island is frequented by many white whales. At the time of our visit the four families in residence at this point were living almost entirely on fish. The salt-water fishery in the harbour itself was producing from a very few nets a surplus to the immediate needs of the community, which surplus was being dried for winter use.

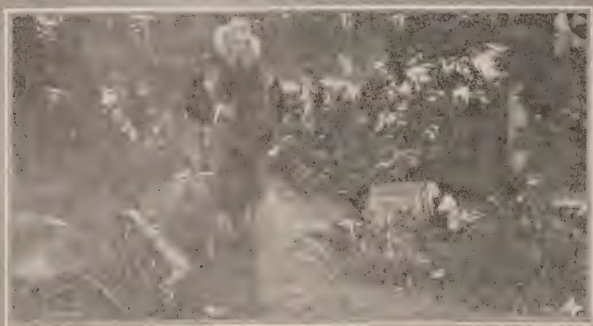
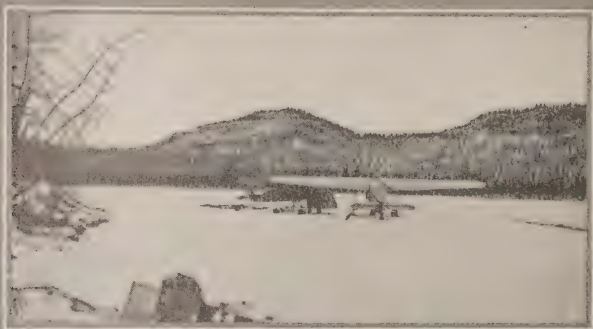
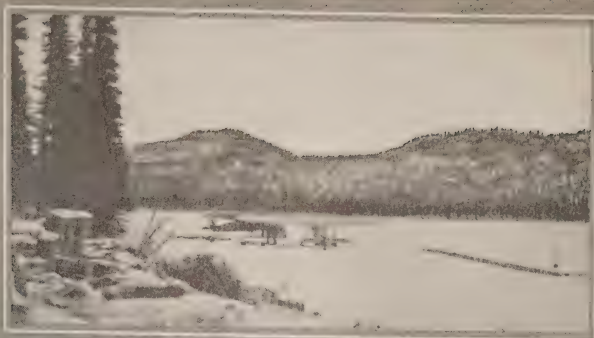
Leaving Tooktoajuak at 7.30 a.m. on August 11 a fairly direct course, WNW., was followed for seven miles. Over the greater part of this run soundings showed three fathoms but in places the water shoaled to seven feet. A deep channel may serve this harbour and would, if it exists, make it a good transfer point for freight, delivered by the Mackenzie River route, to supply the western Arctic coast. The river boats would not be called upon to cross any large stretches of water with the exception of the last twenty-two miles, a crossing that would necessarily be made during calm weather and which is not more dangerous than that of Great Slave lake.

HEAVY WEATHER ENCOUNTERED

By midnight we were off cape Dalhousie where we were met by a heavy southeasterly swell. A rapidly falling barometer and an angry sky both suggested worse weather to come, so anchor was dropped behind a reef which gave shelter from the sea. Three hours later the wind we suspected developed from the southwest and quickly increased to almost a gale. The reef that had given us shelter earlier in the night was now under our lee and, should our one anchor fail to hold, it would be a decided menace, so the anchor was gotten aboard and the schooner moved some miles around the point. Several attempts were made to get the anchor to hold at points along the northeast coast of cape Dalhousie but the bottom was of soft sand and each time the anchor dragged out to deep water. The weather was becoming very thick so the eastern coast of Dalhousie was followed to the south until a shallow bay which gave fair shelter was reached. Here we lay until the morning of August 13. Cape Dalhousie is difficult to approach with even shallow draft schooners and is best given a wide berth by boats of any tonnage.

At 9 o'clock the weather was still foggy and a heavy sea running, but as the wind had fallen and we had sixty miles to open water ahead of us it was decided to undertake the crossing of Liverpool bay. Shortly after leaving the fog cleared. At 2.30 p.m. the southwest sand-spit of Baillie island was reached and the passage south of the island followed to the settlement where the anchor was dropped at 3 p.m. On shore we learned that the Hudson's Bay Company's supply ship, the *Baychimo*, had proceeded east on August 8, this being at least a week ahead of her usual schedule.

We were awakened at 3 a.m. on August 14 by the movements of the boat and on going on deck found that a strong southwesterly wind had come up. The harbour at Baillie is much too large for small schooners, the wind having a ten-mile sweep from the southwest. The storm which thus came on lasted for several days during which four schooners were driven ashore and two of them lost. The *Ptarmigan* had been made secure in the lee of the wreck of an abandoned whaler and rode out the storm safely. This violent tempest continued



AT RELIANCE—1 and 2. Views in the harbour. (Note curling rink to the right.) 3. Dominion Explorers' base. (4) The author, as he reached the first timber, November 14, 1929.

until August 21, at noon on which day the anchor was weighed and a good run was then made to the harbour at Horton River, where we arrived at 8.30 p.m.

SMOKING COAL BEDS

At a point along the coast fifteen miles northwest of Horton River smoke rises from the face of the hills indicating the location of burning coal measures, similar to those near Norman on the Mackenzie river. These beds are reported to have been smoking for generations. Coal beds are known to exist on the southern coast of Banks island which lies across Amundsen gulf from this point. These several known coal areas would suggest that at some points between Norman and Banks island coal measures of economic importance occur.

Next morning, August 22, everything was blanketed by a thick fog which kept us at anchor until noon, when we headed for Booth island which lay fifty miles distant across Franklin bay. At 1.30 a southeasterly wind cleared away the last of the fog, but also developed a fair sea. At 5 p.m. we lost sight of land astern but soon saw the hill tops of cape Parry which lay ahead. When north of Booth island at 8 p.m. the wind had swung due east and was stirring up a heavy sea outside cape Parry, so it was decided to anchor behind the cape for the night.

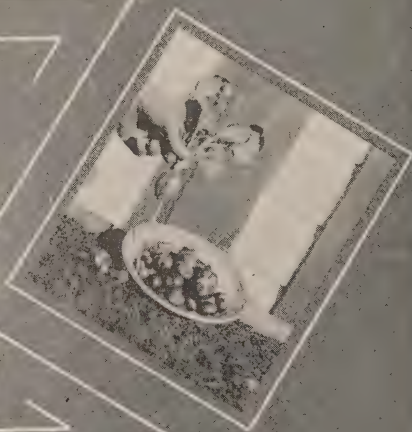
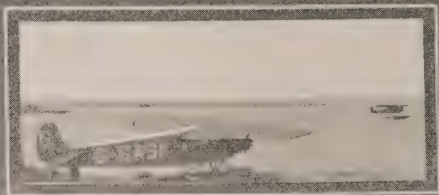
Sailing from our harbour at 3.40 o'clock next morning we passed the headland of cape Parry half an hour later and headed south of west across the mouth of Darnley bay. With a clear sky and smooth sea we made the crossing and were abreast of Pearce point by 11.20 a.m. The hills lying to the southeast of House point were heavily snow covered but at sea-level the air was warm, the weather conditions being similar to Indian summer in Ontario. No stop was made until 6.20 a.m. on August 24, when we arrived at Inman River.

After a two hour stop at Inman River the trip was continued. By noon the schooner was off Wise point; at 5 p.m. Hope point was reached, after a rough trip across Stapleton bay, and Dolphin and Union straits entered. Victoria island was then in sight to the north. We passed cape Bexley at 6.40 p.m. and, changing our course to the south, continued under the shelter of the land. The sun set at 8 p.m. and darkness came on within an hour. By 10 p.m. we had reached an area of many reefs and shoals, so proceeded slowly until a short time later we could hear the water breaking ahead, when the anchor was dropped for the night.

IN TOUCH WITH THE OUTSIDE WORLD

On August 25 we got under way at 3.30 a.m., just as the sun was rising. At 5.30 a.m. the settlement at Bernard Harbour was sighted and an hour later we anchored opposite the Royal Canadian Mounted Police post. A few minor necessities were secured at the trading post and the deck load overhauled and made secure. Constable Wise of the Royal Canadian Mounted Police was working the receiving end of a wireless schedule with the *Baymaud* station and was good enough to supply us with much of the latest news. At 10 p.m. word was received by wireless that the H. B. Company's supply ship *Baychimo* was within a short distance of the harbour and an hour later the ship's lights were seen. Several hours were spent in preparing mail and parcels of photographic films to be sent to Ottawa. The *Baychimo* sailed to the westward next morning.

Our next objective after leaving Bernard Harbour was Cambridge Bay. The most direct route between these settlements lies along the southern coast of Victoria island and as this course was well sheltered from the prevailing north-westerly winds it was decided to use it. We sailed from Bernard Harbour at 5 a.m. on the following morning, laying our course for the south end of Lambert island. The sky was overcast and light fog lay over much of the sea. We



1. Aeroplane used by the author during his 1930 investigations. 2. Government officer with pack dog leaving for the interior, Coppermine, Coronation Gulf, July, 1930. 3. Radishes grown at Bernard Harbour, N.W.T. 4. Aeroplane "CASM", Coppermine, Coronation Gulf.

travelled at half speed until 11.15 when the southern end of Lambert island was passed, and three hours later we were off Lady Franklin point. The coastline was followed eastward until 5 p.m. when a deep bay opened to the north in which we anchored for the night.

DESCRIPTION OF VICTORIA ISLAND COAST

This part of the coastline of Victoria island is composed of light coloured limestone shingle, the land rising very gradually for some miles from the coast. To the eastward the geology appeared to be similar to that just passed, but fairly high hills rose in the distance. A chain of islands lies about ten miles to the south and parallels this section of the coast. These islands rise abruptly out of the sea and are probably composed of basaltic rocks. The bay in which we were anchored extended about three miles to the north and five miles east and west. No shoal water was found on the course we followed to its northern extremity until within four hundred yards of the shore when the lead line showed two fathoms. The bay affords good shelter for all but southerly winds, but the bottom is soft and is not good holding ground.

During the evening an hour was spent ashore but as the country is low no general view was obtained. Eskimo camping grounds, which had evidently been used during the preceding winter, were in evidence as were others which had long been deserted. Seals were occasionally seen along the coastline but no evidence of fish or caribou could be found in the abandoned camps.

We proceeded eastward at 1.30 a.m. on August 28. Three small rocky islands lying five miles offshore were passed at 3.30 a.m. and another small group lay close on shore twelve miles farther to the east. At this point the first rock in place on Victoria island was seen. It consists of a rough outcropping of basaltic rocks rising from a flat country composed of clay and limestone shingle.

At 8.30 a.m. we entered the western end of the channel lying between Victoria island and Richardson islands. This channel, which continues for 25 miles to the eastward, varies from one-half to one mile in width. On the land on both sides of this passage the geology of the country changes completely, being composed of fairly high rugged hills of gneiss and granite. The contacts between this formation and the limestones lie one at each end of the Richardson islands and are very clearly defined. By 3 p.m. the hills of Kent peninsula which lay sixty miles to the southeast began to rise. The country to the eastward reverted to beds of low-lying limestone shingle similar to that in the vicinity of Lady Franklin point. This formation does not change materially at any point along the coastline of southeast Victoria island. The Richardson group consists of three principal islands and numerous smaller ones, and with the southern coast of Victoria island lying immediately north of it, presents the most interesting scenery to be found on the islands of the western Arctic.

Eight hours' cruising east of Murray point brought us to Byron bay where the schooner was anchored for the night in a harbour well protected from the north and northwest. A fair sized stream enters Byron bay at its northwestern extremity and discharges enough water to freshen the surface of the bay for some distance from shore. This is one of the very few points in Coronation gulf where a schooner may secure fresh water without lightering it from shore.

FOGS RETARD PROGRESS

Byron bay anchorage was left at 3 a.m. on August 29, the weather which had been perfect during the previous day having become foggy with a fresh easterly wind blowing. Following the coastline easterly, to Peel point which was reached at 9.45 a.m. we found it fairly straight with only one low gravel



1. Bornite boulder, Hunter Bay, Great Bear Lake. 2. Hunter Bay, Great Bear Lake, showing outcropping of copper ore. 3. Showing open cut across ledge copper ore, Hunter Bay, Great Bear Lake. 4. Outcropping copper bearing rocks, Hunter Bay, Great Bear Lake.

island which lies close inshore. At 2.30 p.m. the first of the Finlayson islands lifted, but shortly afterwards a thick fog came down and it was necessary to feel our way along until we found ourselves close to a large island. At 4.30 we anchored behind one of the Finlayson islands and later spent an hour on shore. This island consisted of igneous rock, much of the surface being overlaid by rough masses of basalt. On the morning of August 30 a northeasterly course was followed until 5.20 when we ran close in shore. Progress was slow until 8.20 when the fog cleared and we located ourselves ten miles southwest of Flagstaff island. Two hours later when well inside Cambridge bay we met the Royal Canadian Mounted Police boat with Constable Millen and two natives on board who returned with us to the post.

August 31 was spent in overhauling the schooner. Four hundred gallons of gasoline were purchased and loaded on board. Building material for a winter camp was also secured and added to our already bulky deck load. During the afternoon the Canalaska Company's schooner *Nigalik* arrived from Bathurst Inlet. The *Nigalik* carried everything necessary to establish an up-to-date fur trading post and early next morning the crew, assisted by several natives, were busily engaged in erecting their several buildings.

VOYAGE CONTINUES TO KING WILLIAM ISLAND

We left Cambridge Bay at 5 a.m. on September 5 and an hour later, when in the outer harbour, a southwest wind quickly developed a heavy sea. The four hundred gallons of gasoline purchased at Cambridge Bay were stowed on deck in 40-gallon drums. When off cape Colborne the lashing securing this part of our deck load parted and a bad half hour was spent in getting the schooner about and making shelter in a small harbour one mile north of the cape. We were fortunate in getting out of this situation without loss of any part of our cargo. By noon the weather had become decidedly bad with frequent heavy snow squalls drifting down the straits. The schooner was, however, well sheltered in our harbour and much of the day was spent in an examination of the south end of Colborne peninsula. During eight hours' walk over low rolling hills and swampy clay flats very little life was seen beyond a few small flocks of ptarmigan. The country has a good number of small lakes and ponds which appeared to have been the breeding grounds of several varieties of duck, loon, and different kinds of small waders, but all had either left on their southern migration or were then flocking on the salt water.

On the morning of September 7, we found four inches of snow had fallen during the night and there was a high wind and heavy sea. By 4 p.m. the wind had gone down somewhat so a reconnaissance trip was taken. However, after rounding cape Colborne the sea was too high for the heavily laden boat and at 5.30 p.m. a good harbour was located where we anchored for the night. Late in the afternoon two hours were spent on shore where numerous modern and ancient native camp sites were found and where the bones of seal and waterfowl gave evidence of a plentiful supply of seal along the coast and birds on the inland waters. A few weathered caribou horns suggested that caribou had formerly ranged on Colborne peninsula, but not for some years past.

The temperature during the night was well below freezing. At 4 o'clock next morning the wind had changed to northeast which gave us a sheltered run for some miles along the coast, so the anchor was gotten on board at 4.30. At 8 o'clock we rounded the western headland of Anderson bay and as the seas were rising we headed northeasterly for a five-mile run to the head of the bay. A small harbour was found where we made a temporary halt. By noon the wind had swung to the southwest with sea enough to make our harbour most



Eskimo types, Cape Krusenstern, Coronation Gulf.

uncomfortable and a better anchorage was found near the foot of the bay. Here the anchor was dropped to wait better weather and we went ashore for the afternoon. On shore the weather was everything that could be desired. Several hills were visited and excellent views obtained of many miles of southeast Victoria island. The country to the north and west was rolling, with hills rising to about 250 feet but eastward lay an apparently endless flat so thickly dotted with lakes and small ponds that it gave the impression of a tidal flat at half flood. Not less than 40 per cent of this area is covered by water. There are many Eskimo landmarks and old meat caches located along the ridges, but none of the bones or horns found were the result of native operations during the past ten years. At one point the skull of a musk-ox was found which had every appearance of having been exposed to the weather for a great many years. Later an inquiry among the older natives failed to disclose any history of musk-oxen in this area during their experience or any tradition citing this district as having formerly been frequented by them.

CHARACTER OF COASTLINE

At the northeasterly angle of Anderson bay a narrow fiord, with almost vertical limestone cliffs rising from the water on both sides, extends between one and two miles to the northeastward. Soundings taken along the fiord gave no bottom at 30 fathoms and while this fiord would make a good winter harbour for larger boats it is not certain that any good anchorage is to be found.

On September 9 we got away at 5 o'clock. Cape Sturt, which forms the eastern headland of Parker bay, was reached at 9.15 a.m. This bay as its mouth is about ten miles wide and runs north for possibly seven miles. Cape Macready lies at its eastern extremity and is about due east of cape Sturt. The whole coastal area is very low and flat, the land consisting of the same combination of clay and light-coloured limestone shingle which has maintained since Murray point. From Anderson bay eastward there is no summer population on the southern coast of Victoria island but during the trapping season a few natives lay their trap-lines as far east as Stromness bay.

At 11.05 a.m. the schooner was off cape Macready with Lind island in sight ahead. The weather was fine but scattered ice was beginning to show which appeared to be more plentiful ahead. By noon the ice situation appeared serious and half an hour later when we neared the north end of Lind island a heavy ice barrier was encountered. An examination along the face of the floe showed no opening to the north. The wind was coming up from the northeast driving the floes southward at a fair rate so it was decided to take cover in Stromness bay.

From the highest points of land in the neighbourhood the situation of the ice-pack was viewed. No lead in the desired direction was to be seen. On the morning of September 10, much ice had backed into Stromness bay, but the schooner was worked to the eastern entrance whence it was attempted to find a passage around the southern end of Lind island. The edge of the pack was followed for fifteen miles when, a heavy sea developing, it was deemed unwise to attempt to cross Queen Maud gulf. Turning northwest, a run was made for Parker bay. Here a small cove was entered but proved so shallow that the *Ptarmigan* grounded.

A view from a hill showed ice conditions still bad. The country was rather desolate. Clay and limestone with much of the rock in place and with a minimum of plant life extended in every direction but many signs were seen of lemmings and foxes. These appeared to have but recently arrived from the north and west and it is possible that they were gathering at this point with a view to invading the islands of Queen Maud gulf during the coming winter.



RYMER'S POINT, VICTORIA ISLAND—1. Native dogs. 2. *Baychimo* at anchor. 3. Eskimo boy.
4. Trader's house. 5. Native house. 6. Eskimo tent of caribou skin. August 13, 1930.

A CRITICAL SITUATION

The schooner floated again at 7 p.m. and on the 11th, another attempt was made to get through the ice barricade. It was unsuccessful, we were driven back into Stromness bay, and again into Parker bay, and from that time until September 14, the heavily laden schooner had a stern battle with high seas, snowstorms, rain, and crushing ice, and was in the most critical position of the entire trip. However by continued exertions day and night the *Ptarmigan* was worked to the mouth of Parker bay at noon of the 14th, and the sea being clear to the westward it was decided to run back to Cambridge Bay, which after a night at anchor in Anderson bay, was reached at 3 p.m. on the 15th.

During this time thousands of salt-water duck, principally old-squaw and eider, were seen flocking for their southern migration. At Cambridge Bay it was learned that the gasoline schooners *Aklavik*, *Blue Fox*, *Nigalik*, and *Polar Bear* had all sailed to the westward the previous day.

Our progress to the eastward having been barred by the heavy ice fields along the north shore it was decided to make an attempt to reach King William island by a more southerly route. As time was pressing we left Cambridge Bay on September 17, the morning after our arrival, and entered upon a strenuous twelve days in fighting our way through ice, small islands, and shoals, and anchoring at night as best we could on an exposed coast.

Our course to Gjoa Haven took us within sight of cape Colborne from which we headed for some small islands lying east of Kent peninsula. Here in a shallow cove we rode out a heavy blow which lasted until September 21. Several trips on shore were made and a number of Arctic hares secured which helped out our rations greatly. The country is rough and high, with gneiss and red granite in place. No signs of caribou were seen but both Arctic hares and ptarmigan were plentiful.

Resuming our eastward journey we laid our course for the islands along the southern coast of the gulf. Great difficulty was experienced in finding a channel across Ellice River delta, and on the following day the edge of the ice-pack was followed until a lead was found through it among some islands close to the south shore. Delayed by uncharted shoals, we reached Perry river where native seal hunters reported the *Fort McPherson* aground. Owing to ice we were unable to render aid, and, continuing eastward, anchored for the night in a good harbour on Johnson point. Next day we passed Stewart point and then our course was along the west coast of Adelaide peninsula, past Grant point, Smith point, and onward till Simpson strait was reached. We anchored on the evening of the 28th, at the Todd islands and made Gjoa Haven the next morning. At this point, the end of our schooner journey, we met Mr. Gibson in charge of the Hudson's Bay Company's post, and other officers, and also Captain Bush of the same company's schooner *Fort James*.

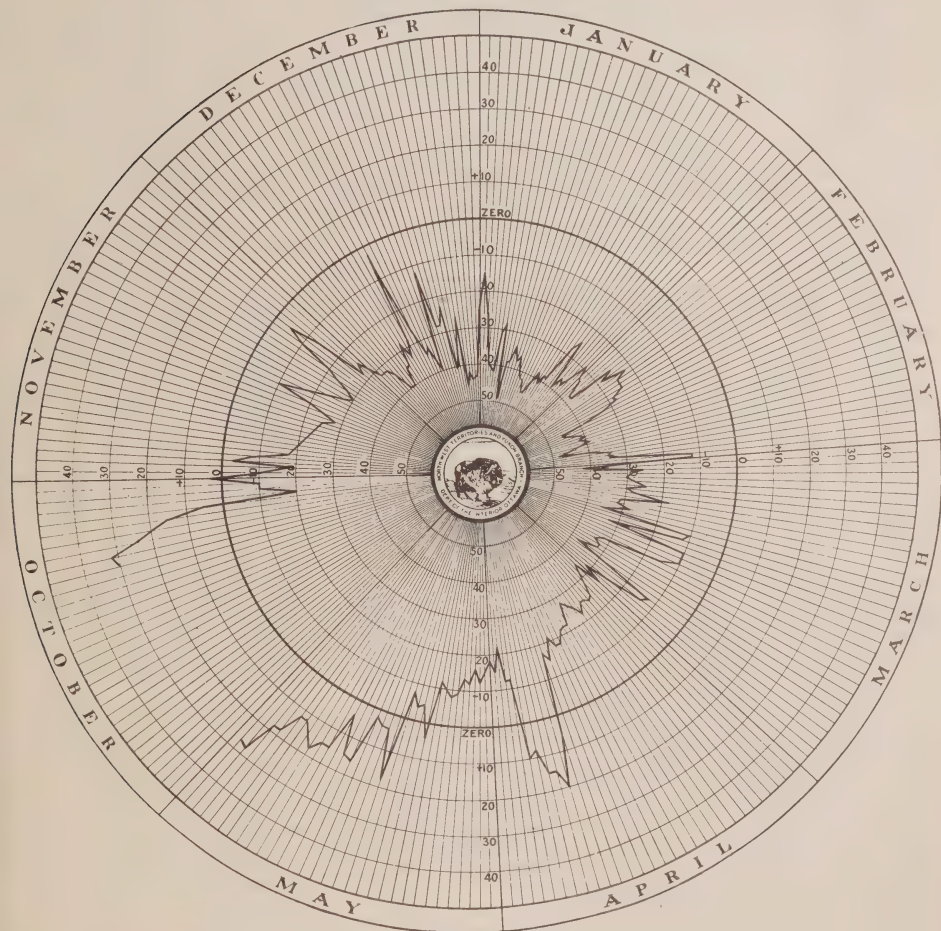
Captain Bush had put the *Fort James*, which was fitted with wireless sending apparatus, into winter quarters at Oscar bay on the west side of Boothia peninsula, about one hundred miles northeast of Gjoa Haven. He had come over in a gasoline launch to advise the company's officers of his winter location and left the next day after our arrival to rejoin his ship. This being in touch by wireless with the outside world was of great advantage in prosecuting our work.

WINTER OF 1928-29 ON KING WILLIAM ISLAND

Within three days after our arrival at Gjoa Haven we had our schooner unloaded and hauled up on the shore. Up to this time the temperature had not fallen low enough to freeze even the more protected salt-water bays, but the air carried that feeling which tells of winter at no distant date and suggested the advisability of completing any necessary outdoor work without delay.

TEMPERATURE CHART

KING WILLIAM ISLAND



Winter, 1927-28

About two weeks were spent in establishing the winter camp at Gjoa Haven. An arrangement had been made with the Canalska Company to occupy their quarters which consisted of a building thirteen feet by fifteen feet with a lumber floor and roof and double canvas walls. To this a canvas ceiling, a double roof, and additional storm windows (which we had brought with us) were added which served until such time as snow was available, when a five-foot snow wall was built around the canvas and two feet of snow placed

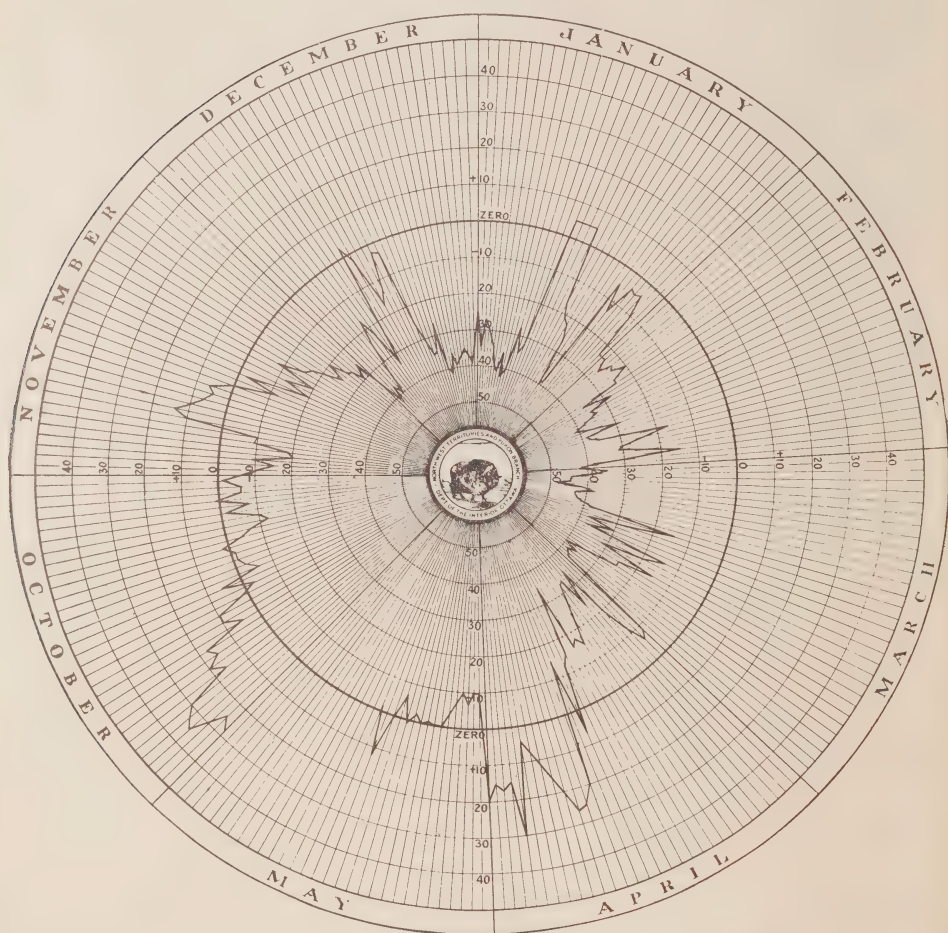
on the roof. These quarters were occupied for seven and a half months and were kept comfortably warm with an expenditure of less than three tons of coal.

SEA-ICE BEGINS TO FORM

On the morning of October 6 much of the harbour was frozen over but during the following three days high winds prevailed which broke up this ice and drifted it out to sea. On October 9 a native shot a caribou quite close to the

TEMPERATURE CHART

KING WILLIAM ISLAND



Winter, 1928-29

camp. So far as could be ascertained this was the first caribou to be killed on King William island since the fall of 1925, the fresh meat for the settlement having since then been drawn from Boothia and Adelaide peninsulas. The wind moderated on the 10th and this fine Indian-summer day was spent in putting the finishing touches on the outdoor preparations for winter. That night was clear and cold and closed our harbour for the winter but it was several days later before the harbour ice was heavy enough to permit a crossing.

On the 11th enough fresh-water ice was cut on a small lake close to camp to supply water for the winter and during the same day a fish net was set under the ice in a lake four miles distant from the settlement. This net eventually produced about one hundred lake trout but they were small and of a decidedly poor quality and could only be used as dog feed. A winter supply of very good fish was later secured from natives on Boothia peninsula. The weather continued clear and cold for the following several days, during which time much of Peterson bay was frozen over and the local natives were able to secure a few seal along the outer edge of the ice.

On October 19 the first large flocks of ptarmigan appeared. From that date until the straits to the south were completely frozen the ptarmigan were plentiful and helped materially in the native food supply. November 4 brought the first winter visitor to the camp; a native named Mike Herschel, who arrived from the Hudson's Bay Company's abandoned post at Simpson strait, where he had established a trapping camp for the winter.

On November 5 three native sleds made the crossing from Adelaide peninsula, and from that date King William island was in communication with the mainland. More natives and their families arrived during the following week and the two trade stores were busy supplying them on credit with small outfits necessary to a trapping campaign. It was quickly apparent to the writer that, during the three years that had elapsed since his former visit to King William island, the native methods of living had undergone a material change. In 1925 few natives had visited the post during the early winter and the few that did arrive appeared to regard their coming more in the light of a social undertaking. They brought fish and meat which they were willing to exchange for white man's food and tobacco, but were slow to ask for credit. In 1928 they arrived in some numbers and appeared to take the credit for granted and to consider commodities, of which four years before they had no knowledge, as essential to their well-being.

FIRST PELTS OF THE SEASON

On November 17, some of the local Eskimos brought in the first fox skins of the season. The 22nd brought more natives to the post, this time a contingent from cape Britannia (west coast of Boothia peninsula).

On December 1, a start was made on a trip by dog-sled to Oscar bay in order to get into touch with the *Fort James* which was wintering there. For several days the trip was continued across the ice, the only land seen being cape Hardy which lies at the southeastern angle of Matty island. On the morning of the sixth day of the journey sled tracks which led towards the northwest were found. By following these, the schooner *Fort James* was reached in the early afternoon. During this trip daylight had lasted less than four hours on each day, with visibility low even during the hours of normal light. The estimated distance travelled between Gjoa Haven and Oscar bay was one hundred miles. This distance was covered in twenty-eight hours' actual travelling time.

Upon reaching Oscar bay the *Fort James* was found to be wintering in the northwestern arm of the bay. The crew had erected a residence and warehouse on shore. The camp included well equipped installations of short and long wave wireless sets and a radio broadcast was in operation. As Captain Bush had thoughtfully kept copies of all news bulletins received we were able to bring our knowledge of world news up to date.

The terrain along the west coast of Boothia peninsula from Sir James Ross strait to cape Adelaide is low and flat and composed of a mixture of glacial clay and broken limestone. The coastline is deeply indented by a series of bays which provide more or less acceptable harbours but the absence of any high land

except at a very considerable distance to the eastward, and the scarcity of plant life, give the country an uninteresting aspect. Practically no signs of either native encampments or of animal life were seen between Sir James Ross strait and cape Adelaide which would lead to the conclusion that the area is, during the winter, at least, non-productive of native necessities. This conclusion was borne out by the fact that upon inquiry none of the natives visiting Gjoa Haven posts appeared familiar with the west coast of Boothia peninsula north of Sir James Ross strait.

On the morning of December 12 we started on our return to Gjoa Haven. The temperature had moderated but the sky was heavily overcast, with light snow in the air, so little was seen of the areas travelled either on this day or in fact at any time during our journey home. Land was reached on the fifth night and shortly afterwards the clouds broke, permitting a view of the stars which enabled us to lay a better course for the following morning. A long sixth day brought us to Gjoa Haven.

WIRELESS REPORTS POLICE PATROL

When at Oscar bay word had come by wireless that a Royal Canadian Mounted Police patrol had left Cambridge Bay for Gjoa Haven on December 1 but upon our arrival on December 17 we found that nothing had yet been heard of it. While this was rather disturbing no relief action could be undertaken as the probability of an expedition travelling westward meeting the patrol was most remote.

After spending several days on overhauling and drying our travelling outfits our thoughts turned towards Christmas. It was decided that all of the white population should spend Christmas Day, 1928, at the Hudson's Bay Company's post and New Year's Day, 1929, in the Canalaska Company's post. Christmas passed off very satisfactorily. Dinner was served at noon to all the natives in camp and later in the day to the others.

On the evening of December 26 two natives arrived in camp who reported that the Police patrol in charge of Constable Millen was camped on the ice for the night at a point about five miles from the post and would reach the settlement on the following morning. The patrol had spent twenty-seven days on the trail between Cambridge Bay and Gjoa Haven, a distance of 300 miles, when the usual trails were followed. It was found that the delay was caused by bad weather, very rough ice, and the necessity of going out of their course to secure feed for the dogs.

New Year's Day, 1929, developed one of the worst blizzards of the winter, so bad in fact that the staff of the Hudson's Bay Company at first thought that it would be unwise to attempt the trip to our house for dinner, although the distance was only two hundred yards. They made the trip however, and an enjoyable evening was spent in spite of the conditions outside of the house.

During the following two months the regular winter routine was followed. Constable Millen left for Cambridge Bay on January 10 and native trappers turned up periodically to dispose of the results of their work. Much of the weather had been cold and stormy but an occasional fine day permitted a walk over the low hills or across the sea ice.

On March 2 Mr. Brown, transportation agent of the Hudson's Bay Company, stationed at Wager Inlet, arrived at our camp. He had accompanied a gasoline tractor from Wager Inlet to the mouth of Back river and travelled by dogs from that point to Gjoa Haven. The trip by tractor had been slow. Cold and stormy weather had prevailed throughout much of the time and many difficulties had been met and overcome along the trail. This trip was made to examine the ground with a view to establishing a freight route from Atlantic waters to the western Arctic.

JOURNEYS TO THE MAGNETIC POLE

On March 4, accompanied by Mr. Brown and two natives, we undertook a trip to Oscar bay with the intention, should weather conditions permit, of proceeding to the magnetic pole where magnetic observations would be taken. As daylight now lasted for nearly twelve hours only three days were necessary in making the trip but while the weather was clear and bright the temperature fell to the lowest point of the winter, 51° below zero being recorded on March 5. Ten days were spent in exchanging wire messages with Ottawa.

The return trip to Gjoa Haven occupied only three days and March 21 found us back at our winter base. The weather continued cold and windy until the end of the month, the first indication of a break occurring on April 2. Preparations were commenced for a third trip to Oscar bay with the hope that conditions would make magnetic observations in the vicinity of cape Adelaide possible.

Accompanied by two Eskimos, the writer left Gjoa Haven on April 6, reaching the schooner *Fort James* two days later. The weather was fine and clear but still cold. The chief drawback to travel during this season is the glare of the sun on the snow.

MAGNETIC OBSERVATIONS

Leaving Oscar bay on April 9 the coast was followed to the north for thirteen hours, when cape Adelaide was reached. Camp was made about three miles east of the western point of cape Adelaide, where two igloos were erected, in one of which we camped, the other being used as an observatory. No success was met with when observations for magnetic declination were undertaken, but several series of observations with the dip circle were successful. The several series of dip circle observations taken in our observatory gave an average dip of $89^{\circ} 49'$. When the dip circle was set up at a point close to the western end of the cape and about three miles from the camp, readings both sides of vertical were obtained with an average of approximately 90° .

On April 13 the camp was moved to cape Victoria, the southern headland of Kent bay. This point lay about twenty-one miles south of the observatory on Adelaide peninsula. Here two igloos were built, in one of which we lived, the other being used as an observatory. At this point the horizontal needle was all but inert, so observations for magnetic declination were not taken. The dip circle, however, worked satisfactorily and a series of readings for dip was obtained which gave an average of $89^{\circ} 35'$. Breaking camp early on April 15, we reached the winter quarters of the *Fort James* at 7 a.m. and the day was spent in making observations for dip and total intensity. At this point the average of the readings made showed the dip to be 89 degrees 45 minutes.

INVESTIGATIONS REGARDING THE FRANKLIN EXPEDITION*

When leaving Oscar bay for Gjoa Haven on April 17 a more westerly course was followed than on previous occasions. The island lying northeast of Matty island, close to which the natives report the wreck of a ship, was visited but the country was still completely covered with snow and ice and nothing of interest could be seen.

Later, when at Gjoa Haven, we met the two old Eskimos who were the discoverers of this wreck and their complete story was obtained. From what they tell one is drawn towards the conclusion that the ultimate fate of the Franklin party differed materially from that ordinarily pictured.

* See also "Franklin Investigations, King William Island," in Part III, and Appendix C.

The record found by Captain M'Clintock in 1859 established the fact that the *Erebus* and *Terror* spent from September, 1846 until April, 1848, locked in the ice at a point eighteen miles northwest of Victory point. During this time the crews of both ships remained on board, probably making occasional trips to the land at Victory point and to points beyond. A postscript added in 1848 to the record that was deposited on shore at that point in 1847 states that all the remaining personnel from both ships were proceeding south along the west coast of King William island with the mouth of Back river, and eventually Great Slave lake, as their objectives.

From native reports gathered some years later the party was seen following their proposed route at a point far south of Victory point. From evidences since observed it would appear that the strength of some members of the party soon began to fail, as at many places along the coastline from Franklin point, which lies only fifteen miles south of Victory point, to Starvation cove (at the north-eastern angle of Adelaide peninsula) graves have been found and also not a few skeletons of white men whose comrades were evidently in too serious a condition to bury them.

The postscript of 1848 stated that 105 men left the ships but of these more than one-half are not yet accounted for. The trail followed to Starvation cove, where many skeletons were found, is clearly marked but beyond that point nothing has been found with the exception of a cache and remains of a boat which were located by Anderson and M'Clintock on Montreal island. Both the articles in the cache and the remains of the boat may well have been placed in the position in which they were found by natives who frequently travel along this route.

PROBABLE FATE OF FRANKLIN PARTY

It would therefore appear that of the original party to leave the ships many perished along the route of travel so well marked by their graves, that the party divided and that the last of those proceeding towards Back river died at Starvation cove. The fate of those who separated themselves from this party is as yet unsolved. That they could have undertaken to reach Back river by an overland route, by leaving the south coast of King William island at some point west on Simpson strait, is very improbable, as their route would surely be quite as clearly marked as that followed by the others, and this is certainly not the case. The alternative would be that when the strength of the personnel showed serious signs of failing, half or more of the party were sent back to the ships, while the others, probably the more exhausted, either moved ahead slowly or remained in camp at Starvation cove, where so many are known to have died.

The party left Victory point about the end of April and might under the circumstances occupy sixty days in reaching Starvation cove. If at that time it was seen that to continue in their endeavour to reach Great Slave lake was for many of them hopeless, the one hope of improving their condition would lie in the possibility of re-manning and freeing their ships from the ice and in bringing supplies to those possibly unable either to proceed or return to the ships. While it cannot be said that there is complete evidence that this course was adopted, the published facts as established by those who have visited the country (M'Clintock, 1858-9; Capt. Hall, 1864-69; Lieut. Schwatka, 1878-79; Rasmussen, 1923; and Peter Norberg, 1923), together with more or less authenticated information secured by the writer during the past year, may readily be fitted together to conform with this theory.



Native types, Rymer Point, Victoria Island.

NATIVES RECOUNT THEIR DISCOVERIES

In 1925-26 the writer spent some months near Tulloch point, making several trips to the eastern part of the island where many of the Netchelu tribe of Eskimos were met with. From several different native sources it was learned that these natives had for many years been aware of the fact that the wreck of a large vessel lay submerged off the northeastern extremity of Matty island. At this time the information received dealt with a sunken ship only. As it was not possible for the writer to remain in the vicinity of King William island until the sea at this point would be free of ice, nothing could then be done to check this story. The information, however, covered the fact that two old men who made their home on the east coast of the isthmus of Boothia were more familiar with this area than were the others. During 1928-29 the writer again visited this area, spending the winter at Gjoa Haven.

In April, 1929, both of the old men above referred to, Enukskakak and Nowya, visited Gjoa Haven and the writer secured the following statement from them. It may be said that both of the above natives, Enukskakak and Nowya, are men apparently of more than sixty years of age. This is, of course, a matter of conjecture as no primitive Eskimo has any precise knowledge of his age nor in fact does he think in numbers greater than ten. In estimated ages of the old Eskimos due allowance must be made as much depends upon the judgment of the person making the estimate. Both Enukskakak and Nowya were in agreement as to the details as hereafter recited.

When they were both young men, possibly twenty years of age, they were hunting on the ice in the area immediately northeast of Matty island. When crossing a low flat island they came upon a cache of wooden cases carefully piled near the centre of the island and about three hundred feet from the water. As described by them this cache covered an area twenty feet long and five feet broad and was taller than they were (more than five feet). The cache consisted of wooden cases which contained materials unknown to them, all of which were enclosed in tin containers, some of which were painted red.

To them and one other native with whom they shared the find, the wood in the outer casings formed the only prize. They said that on the outside of the pile of boxes the wood appeared old but the parts sheltered from the weather were still quite new. All of the boxes were opened by the natives and the wooden cases divided between them as the lumber was much desired for the manufacture of arrows. Enukskakak's share was eleven cases, Nowya's nine and their friend two, making twenty-two cases in all. After the wood had been divided they opened the tin containers but found them to contain materials of which they then had no knowledge. In a number they found a white powder which they called "white man's snow" which they and their families threw up into the air to watch it blow away. Since learning more about the white man's supplies they have come to the conclusion that some of the cases contained flour, some ship's biscuits and some preserved meat, probably pemmican, but they were still uncertain as to the contents of a part of the cache. All of the tin containers were cut open but none of the contents eaten as they did not think they were good. The empty tin containers were left scattered on the ground.

They also secured at this time a number of planks which they described as being approximately ten inches wide and three inches thick and more than fifteen feet long. These they found washed up on the shore of the island upon which they had found the cache and on the shore of a larger island nearby. Before the time of the finding of the cache on the island the natives had frequently found wood (which, from their description, consisted of barrel staves) and thin iron (apparently barrel hoops) at various points along the coast lines in this area.

The wreck itself which had long been known to the natives lay beneath the water about three-quarters of a mile off the coast of the island upon which the cache was found. At the time they found the cache no cases had been opened and all were still closely piled together, indicating that whoever had put the cache in position had not revisited it.

Enukshakak and Nowya both gave it as their opinion that the boxes had been put on the island by white men who had come on the ship which lay on the reef offshore. When asked what remained upon the site of the cache both natives said that a few years ago when they had last visited the island only the marks of rusty tins were to be seen. The writer visited this island in April, 1929, but found a low flat terrain still covered with snow and was therefore unable to even check up the rust stains which should still be in evidence.

RECAPITULATION OF FRANKLIN FACTS

To recapitulate the known facts and natives' tales which tend towards the theory that the Franklin ships were re-manned and eventually arrived, one off O'Reilly island and the second off Matty island, and there wrecked each with a crew aboard.

M'Clintock reports the following facts: Two native settlements on the east coast of King William island (along Wellington strait) were visited where wood such as would have been salvaged from a wreck, was more or less plentiful. He also reports a third settlement at Booth point where wood was in evidence. A cairn containing a white man's knife was found at Livingstone point. The boat found by himself and Lieutenant Hobson at Erebus bay was pointing towards Victory point, indicating that it had been abandoned on a march towards the ships and not towards Back river.

Hall reports cairns at Castor and Pollox river and Clouston point, surmounted by long stones which appeared to indicate the route of travel by those who erected them as leading from the cairn found by M'Clintock at Livingstone point to Castor and Pollox river, then to Clouston point on the eastern coast of Simpson peninsula and thence in a northeasterly direction across Committee bay to the northern end of Melville peninsula. Hall also secured information from the natives that white men had wintered on the isthmus of Boothia and that approximately the same number of white men had been reported on north Melville peninsula during the period 1853-54-55.

Schwatka learned of the ship frozen in the ice a short distance northwest of O'Reilly island with one dead man aboard and of the evidences of white men having visited the west coast of Adelaide peninsula not far from the location of this ship. He also corroborated M'Clintock in many details of evidence found along the western coast of King William island including the statement that the boat at Erebus bay was abandoned while returning to the Franklin ships.

To the above the writer can only add the native history of a wrecked ship northeast of Matty island and the finding of a cache on a small island close to the scene of this wreck.

Should Hall's reports be disregarded as not entirely essential, the data gathered by M'Clintock, Schwatka and the writer, if accepted, can only be harmonized by the theory that the ships were eventually brought to their final resting places while more or less under the control of their crews. The principal significance of this would lie in the fact that a crew undertaking to bring the ships out of the ice would most certainly carry with them the log books of each ship and in all probability the complete records of the expedition to date. This theory would account for the fate of many of the party and also for the complete absence of any written records of the expedition.

JOURNEY WESTWARD TO THE COPPERMINE

During April, 1929, while at Oscar bay, the writer received instructions from Ottawa by wireless to visit the mineralized areas of Coronation gulf and Bathurst inlet during the following summer. Upon the return to Gjoa Haven on April 17 some time was spent in making magnetic observations, after which there was much to be done in closing the winter base and in preparing for a 600-mile ice trip to the westward. The weather during the latter part of April and the first two weeks of May was bright, with temperatures dropping to zero but until late in the latter month no real suggestion of spring was given.

The winter camp at Gjoa Haven (southeast King William island) was abandoned on May 17, 1929. The weather being clear and very bright, the start was delayed until 7 p.m. as for several weeks prior to the above mentioned date much trouble from snow blindness had been encountered.

During the winter of 1928-29 the dog market was at its lowest ebb as regards the supply of dogs, the Arctic dog sickness having recurred each winter since 1926. No team for the trip through to Cambridge Bay could be secured so it was decided to stage through from one Eskimo camp to the next, a somewhat risky experiment, but no alternative presented itself.

The first stage, Gjoa Haven to Simpson strait, was made in fourteen hours without incident other than the meeting with two Eskimos who carried the one winter mail to reach King William island during the year. A number of letters were received, the latest dated November, 1928. No departmental mail was in this budget.

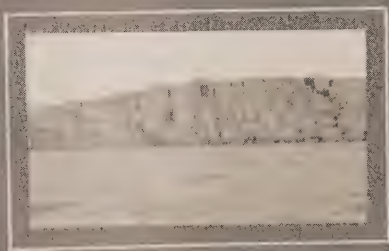
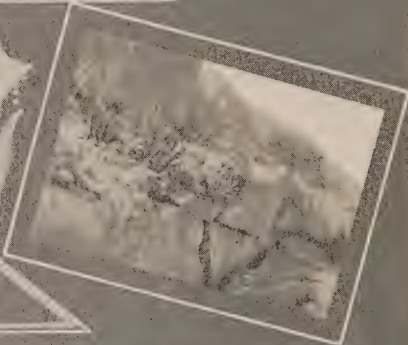
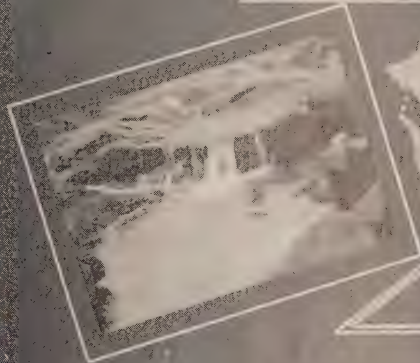
In two short stages during which five small dog teams were used, Etanik island was reached. This island was, or had been, the sealing headquarters for the eastern end of Queen Maud gulf, but only deserted igloos welcomed our party on May 20. A camp was built for the night and next morning a native trail to the northwest was followed, two light sleds being used, and the loads brought from Gjoa Haven left cached at our camp. A fairly large Eskimo camp was sighted after thirty miles of fast travel. The Eskimos gave the party a warm welcome and a most acceptable meal consisting of seal stew, hardtack, caribou fat (frozen) and tea, after which successful negotiations were made for a sled and eight dogs with which to continue the trip. From this point to Perry river and on to Cambridge Bay the difficulties from lack of means of transportation continued, much of the journey having to be gone over again in relays and also a considerable portion on foot, dragging the sled.

The trip from Perry river to Cambridge Bay is, under the most favourable circumstances, considered a four-day journey, the distance being 150 miles, but in spite of our limited transport we arrived there only one day behind schedule. Several days were spent at Cambridge Bay arranging for the next stage (Cambridge Bay to Wilmot island).

MINERAL INVESTIGATIONS EN ROUTE

Five days later (June 16), during the last two of which travel had been through from one to two feet of water lying on top of the salt ice, Wilmot island was reached. At this point is located the headquarters of Mr. Patsy Klingenberg, the well-known Arctic trader. By that date travel on the ice had become almost impossible, so nothing remained but to await open water. This was however not entirely unfortunate as the northeastern extremity of the mineralized area of Bathurst inlet had been reached and while the season was not the best for our work, it was possible by use of a combination of sled and canvas boat to look over much of the northern section of this area. The results of these observations are given in the latter part of this report.

At the time of our arrival at Wilmot island the snow was almost entirely gone from the land and the sea-ice was to a large extent covered by water. On



ALONG SOUTH COAST OF CORONATION GULF—1. Power boat in which July, 1930, trip was made.
2. Waterfall between Tree River and Kugaryuak. 3. View taken near Tree River. 4. The coast,
twelve miles west of Tree River. 5. Trader's camp, Detention Harbour, Bathurst Inlet.

June 20 the weather changed. A strong southeast gale developed which was accompanied by heavy snow. By the 21st the temperature had fallen well below freezing and as the gale increased, a blizzard of no mean proportions developed which lasted until the night of the 22nd, when the weather again became normal and the snow which then covered the country to a depth of about two feet quickly disappeared. The land was again free of snow by the 27th and from that date until the 12th of July many trips were made over the islands to the north and south.

From July 12 until the 26th, upon which date it was possible to leave the island by schooner, no work could be done. On July 25 the Canalska schooner *Nigalik* arrived from Bathurst inlet and remained for the night in the harbour. At 10.30 a.m. on the 27th the *Nigalik* sailed for Bernard Harbour, taking a course somewhat west of north in an attempt to reach open water north of the Jameson islands. At 2.30 the same day Mr. Klingenberg left in his schooner, the *Nauya*, with myself as a passenger, for Kugaryuak, a Hudson's Bay Company post fifty miles east of the mouth of Coppermine river. An attempt was made to follow the course taken by the *Nigalik* but floes which she, a much heavier boat than the *Nauya*, had penetrated, turned us to the west and later almost due south. By 4.30 p.m. ice which could not be navigated was reached and the anchor was dropped until conditions improved.

At 8.30 p.m. a change of tide slackened the ice and it was found possible to work through the floes as far as a small island lying fifteen miles westerly from Wilmot island. It was upon this island that Mr. Klingenberg's schooner, the *Dr. Rimer*, was wrecked during August, 1928, so a stop was made to secure ninety gallons of gasoline which had been salvaged after the wreck. During the time spent on this operation the ice again closed in and it was not until 8 a.m. on the 28th that it was possible to continue the journey. Two hours' strenuous and somewhat hazardous work brought our schooner into a fair lead which gave an open channel to cape Barrow. It was found that the ice had injured the rudder and a two-hour stop was made to effect temporary repairs. A crossing to the Jameson islands was made under conditions none too favourable but upon attempting to proceed to the westward a solid barrier of ice was encountered.

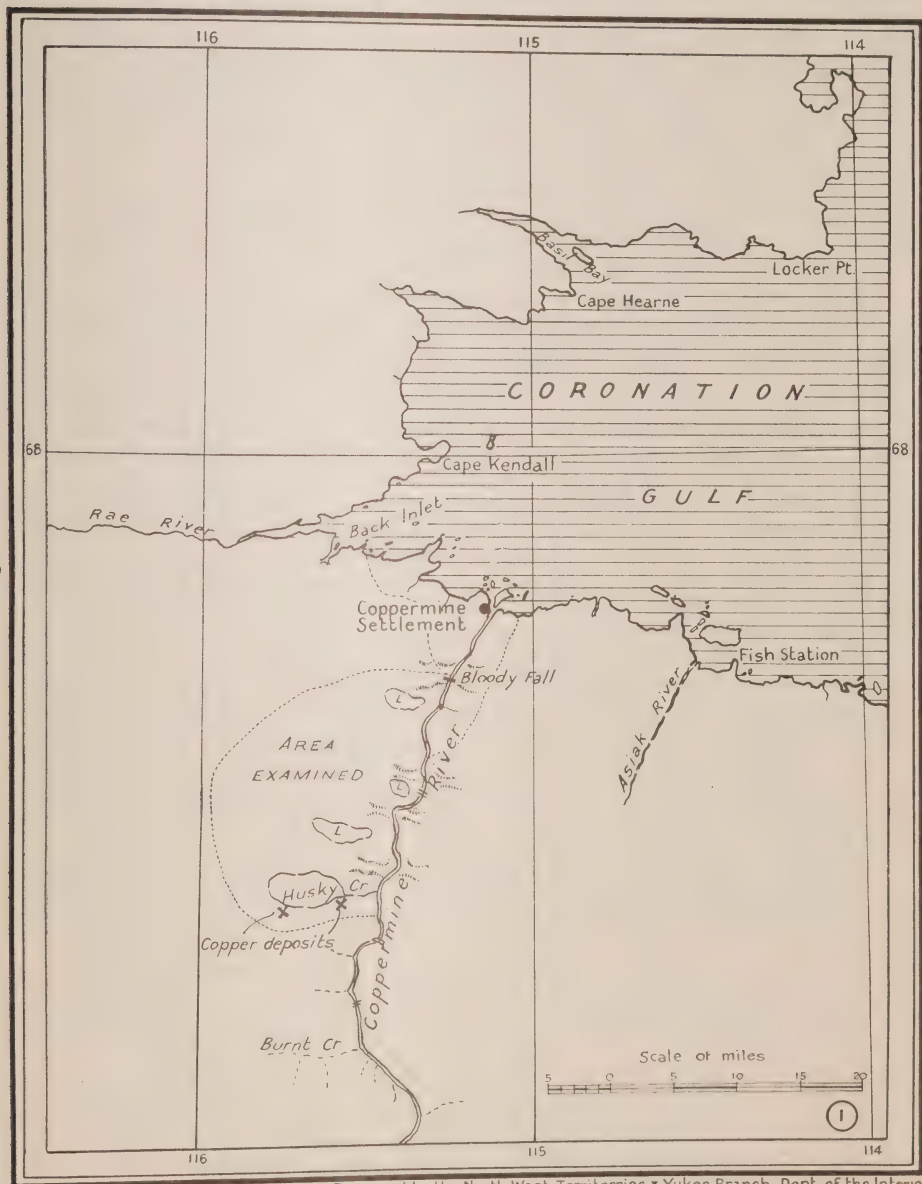
The party landed on the most westerly of the Jameson islands, which is a tableland several hundred feet high, and climbed to the high ground to observe the ice conditions to the westward. By 1.30 p.m. on the 29th the ice loosened and three hours' sail brought the schooner abreast of Hepburn island. From this point to Kugaryuak small open leads were found which followed a general westerly course, but which led the schooner much farther north than was desired, the route followed being twelve miles off shore when Tree River post was passed.

Upon reaching Kugaryuak, I went ashore as the schooner *Nauya* was proceeding to Bernard Harbour. Kugaryuak is a small river at the mouth of which trading posts have been established by the Hudson's Bay Company and Watson & Craig. It is from this point that the natives when travelling inland leave the coast as the valley of the Kugaryuak affords the best route to the interior.

On July 30 a gasoline boat was secured from the Hudson's Bay Company and at 3 p.m. our trip was continued towards Coppermine. Much ice was encountered for some miles west of Kugaryuak but the gulf was clear for twenty miles east of Coppermine. At 8 a.m. on the 31st the settlement at the mouth of the Coppermine was reached. The site and the buildings at this point are probably the best along the Western Arctic coast, and the river produces a plentiful supply of high grade fish. The fishery is quite as important as the fur post, as not only are many salmon dried and exported to other company posts, but also the fishery products make possible the rearing of many dogs for distribution along the coast.

THE COPPERMINE MINERAL AREA

Heavy rains fell on the morning of August 1 but slackened somewhat towards evening. Leaving the Hudson's Bay post at 7 p.m., we reached Bloody fall three hours later. Here nine Eskimo camps were found which house about fifty persons in all. These people were engaged in fishing and were being well repaid for their efforts. The fish taken in excess of their immediate needs were being dried for winter use.



Prepared by the North West Territories & Yukon Branch - Dept. of the Interior

Sketch map of lower Coppermine Valley.

For the trip inland I engaged the necessary native help and arranged to leave for the interior next morning, August 2. It may here be mentioned that Bloody fall is not a "fall" as generally understood, but a crooked canyon with a heavy current throughout its length of one and three-quarter miles.

On the morning of August 2 four natives and I, accompanied by two pack dogs, started inland, our primary objective being the placer copper areas known to the natives. On this trip it was necessary to carry a tent, mosquito bars, and light blankets, but it was decided to leave the fuel supply to chance, a decision which lightened packs materially and caused us no inconvenience later as the willows and bracken proved adequate for our needs. A long day's march in a southerly direction was made. Our trail occasionally followed close to the western bank of the Coppermine river, but more often paralleled it at some miles distance. The country consisted of wide grassy valleys separated by abrupt basaltic ridges. Fairly well developed willows grow in the protected areas. After a fourteen-hour day, camp was pitched on the southerly face of a low ridge, a short distance north of Husky creek and five miles west of the river. As the natives reported that the first of the areas from which they had frequently gathered copper lay in the valley immediately in front of us, it was decided to make this the site of our base for the time being.

August 3 was spent in the examination of two areas from which the Eskimos have for generations secured native copper for their needs. The first area lies one mile south of Husky creek and here there is one nugget of native copper weighing approximately 600 pounds and fine copper scales mixed through the soil in its immediate vicinity. This deposit, which is manifestly the result of glacial action, lies in a grass-covered flat, the soil being a mixture of clay and sand. In addition to the copper, well-worn glacial drift made up of rocks indigenous to the immediate country, occurs. The showings at this point cannot be considered as more than indications of deposits of copper in place in the area but at some distance from the specimens seen. Both the copper and rock in the showing are much worn and have travelled many miles before being deposited in their present location. The second area examined lies about eight miles farther west and consists of smaller specimens of copper (pieces up to fifteen pounds have been found), but the samples occur more frequently and are spread over a greater radius than in the first area. This deposit has also been built by glacial action and from the appearance of the glacial drift both copper and rock may easily have the same source as those of the first area. From the second area a course was taken in a northerly direction across wide flats to a small range of hills some ten miles distant. These were examined, but, although the geology is similar to that of the country to the south, nothing indicating the proximity of copper was seen. Camp was reached at the close of a nineteen-hour day.

August 4 was spent in an examination of the country north and west of the camp where the geology was found to be similar to the other areas visited, but no special mineralization was seen. About twenty miles of country was traversed.

On the 5th, the camp was moved back to the foot of Bloody fall, the route followed lying about ten miles west of Coppermine river until the barrier forming Bloody fall was reached. This was then followed eastward to the campsite at the foot of the fall.

August 6 was spent working along the hills to the east of Bloody fall where the geology was found to be much the same as seen in other areas, the only variation being a series of steep clay hills which rise to about three hundred feet above the valleys. No promising mineralization was seen on this trip.

On the 7th the camp equipment was sent to the Hudson's Bay Company's post by canoe, while I accompanied by a native walked across country. The

area crossed is much lower than above the fall, with infrequent exposures of rock in place, the larger part consisting of heavy deposits of sand and glacial clay. The rocks observed were of the Coppermine series. As the Hudson's Bay Company supply ship *Baychimo* was scheduled to arrive at Coppermine on August 8, it was not considered advisable to leave the vicinity of the post for more than twenty-four hours, so short trips east and west and to islands in the vicinity were undertaken. The coastal areas and the islands in so far as they were examined, corresponded geologically with the valley of the Coppermine river, but no encouraging mineralization was observed.

The *Baychimo* finally arrived on August 22, having been delayed two weeks by ice at a point west of Herschel island. Among those leaving the ship at Coppermine was R. D. Martin, M.D., who had been sent north as medical officer by the North West Territories and Yukon Branch of the Department of the Interior.

RETURN JOURNEY TO OTTAWA

Arrangements for the closing up of the work required my return to Cambridge Bay, from which point it was expected that I would take passage on the *Fort James* and return to Ottawa by the eastern route. However, the decision of those in charge of the *Fort James* not to risk crossing Queen Maud gulf, but to proceed at once to the eastward, necessitated a change of plans. Coincident with this was the announcement of the misadventure which had befallen the Dominion Explorers aerial party headed by Colonel MacAlpine. A journey was therefore made to Burnside River on Bathurst inlet, the Dominion Explorers' base, where assistance could be given in the search for the missing aviators and whence, as it transpired, transportation was secured to civilization.

The base was reached on September 23, and word was received on November 5 that the MacAlpine party was safe at Cambridge Bay, but it was not until November 12 that a start could be made for Winnipeg. During the month spent at Bathurst inlet opportunities occurred for the examination of mineral areas extending from Wilmot island southward, the results of which are detailed in the succeeding section of this report. The trip by air to Winnipeg was in five stages with the following points as the stopping places: Muskox lake; Old Fort Reliance, at the east end of Great Slave lake; Stony Rapids, east end of lake Athabaska; The Pas; and Winnipeg. The progress of the planes was necessarily slow, since the trip took place in the between-season period when the large lakes, not being frozen over, caused the prevalence of fog at critical stages of the journey.

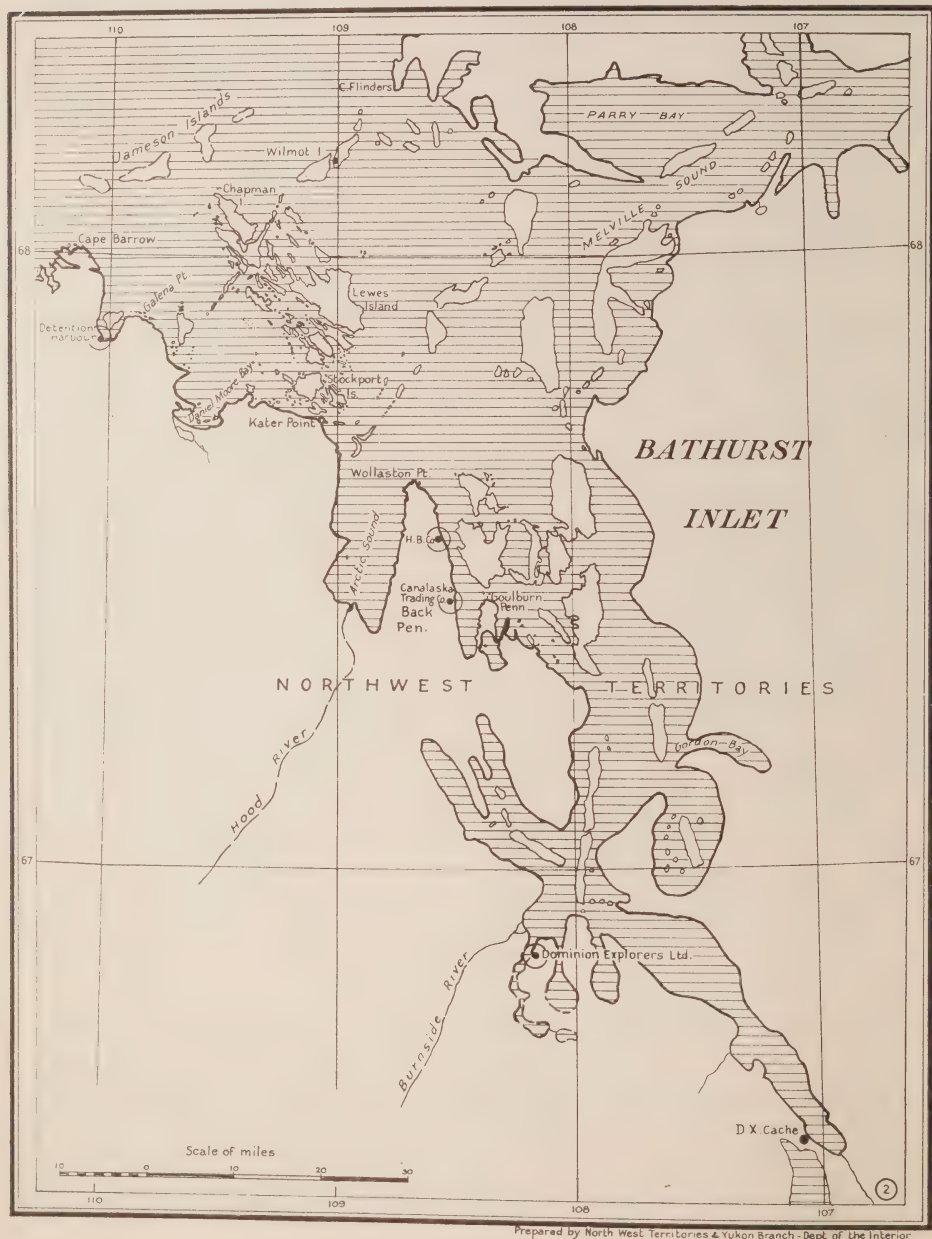
During the last hour of the trip from Muskox lake to Old Fort Reliance, a wonderful view of caribou migration was afforded us. Over a distance of approximately one hundred miles the country was dotted with caribou, the limits of the herds extending east and west beyond our vision. Later, when travelling southwest from Reliance, a similar spectacle extended for fifty miles.

Delays of various kinds arose, but on the afternoon of December 6, the three planes arrived safely in Winnipeg and the long trip from the North was over. Ottawa was reached two days later.

SUMMARY OF RESULTS OF MINERAL INVESTIGATION, 1929

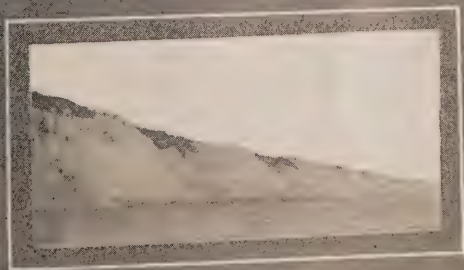
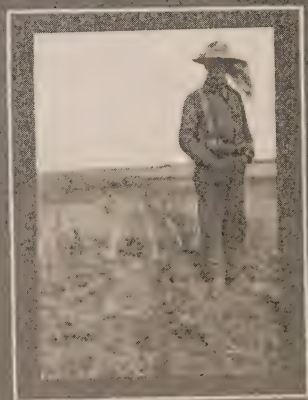
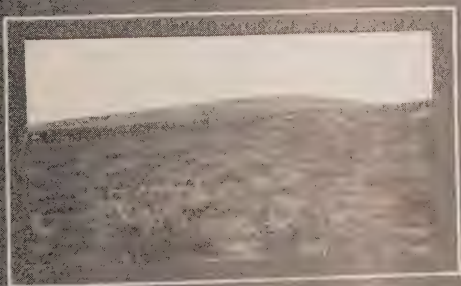
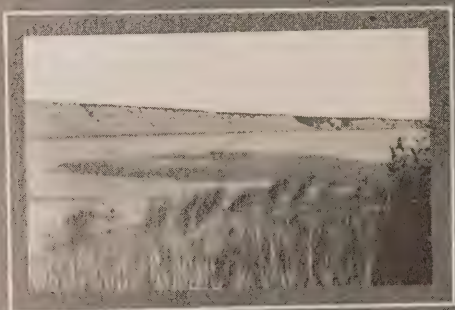
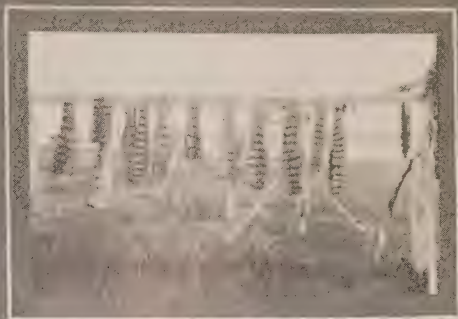
When reaching Coronation gulf in June, 1929, the writer was quite without information concerning the occurrences of copper in this region other than a somewhat hazy recollection of reports read several years before. The line of action decided upon in making the examination of mineralized areas was to secure from the local Eskimos the position of all points at which they had found native copper or had seen the green stains indicative of the presence of copper in some form.

Natives met at Wilmot island were familiar with both the Coppermine and Bathurst Inlet areas and from them much information was secured. None of them reported any signs of copper between Kugaryuak river and cape Barrow but all agreed on various points in the valley of the Coppermine river and on the western mainland and adjoining islands of the north end of Bathurst inlet. Other natives met with during the summer only corroborated the information secured at Wilmot island, none having new locations to suggest.



Prepared by North West Territories & Yukon Branch, Dept. of the Interior

Sketch map of Bathurst Inlet.



RICHARDSON RIVER, CORONATION GULF—1. Drying large trout. 2. Some local helpers. 3. View 15 miles up river. 4. Plateau 25 miles up river. 5. View 15 miles from mouth. 6. Potato patch.

Many of the islands both north and south of Wilmot island showed native copper in place and, from one, a good specimen of chalcopyrite was secured. In the Bathurst area by far the greater percentage of native copper occurs finely distributed through massive basaltic rocks, the copper particles becoming heavier in what would appear to be the more rapidly cooled sections of the flows. Copper particles are not always found throughout the basalts of this area but are of very frequent occurrence. In places, narrow veins of copper were seen in these basalts, some of which could be traced for several feet, but nowhere were these veins seen in sufficient numbers to suggest that the copper they carried would warrant the mining of any considerable block of ore. The value of the rock carrying finely disseminated native copper could not be approximated in the field but by reference to Dr. J. J. O'Neill's report (see Vol. XI, *Canadian Arctic Expedition 1913-18*, Department of Mines, Ottawa), it is learned that these masses prove to be quite low grade. The only sample of chalcopyrite seen was found on an island lying about five miles north and slightly east of Wilmot island. This was, incidentally, the most northerly trace of copper found in this area.

On the eastern side of Back peninsula is one of the largest individual areas showing copper in place. Along this shore line the natives report that some years since a large copper nugget was to be seen imbedded in the face of a cliff. They stated that it was their practice to visit this nugget and cut pieces off for their various uses. Later this nugget became displaced and fell to the level ground below where it has since been buried by talus.

The Bathurst Inlet area that appears to be worth investigation extends from five miles north of Wilmot island to a point near the south end of Goulburn island (note: Goulburn "island" is in reality a peninsula). The east and west extensions of this area were not fully determined but it will include the western coastline of Bathurst inlet, the islands opposite and the islands north of Kater point.

To sum up the possibilities of this area: nothing to suggest a "ready made" mine was seen but the extent of copper-bearing rocks is very great. Copper seen in the drift to the westward and also that reported by the natives as having been found in this area indicate a location or locations where the copper occurs in much greater abundance and in more massive bodies than have yet been seen by white men. In my opinion this area is well worth systematic investigation by competent prospectors. (Note: For the general geology of this area, see Volume XI, *Canadian Arctic Expedition, 1913-18*.)

The only other area, calling for examination, according to the information received from the natives, was the valley of the lower Coppermine. The native knowledge of copper occurrence in that section appeared to be confined to two locations in which massive copper was to be seen in the glacial drift. Both occurred in low mounds rising from meadowlands in the broad valley of a small stream which joins the Coppermine about twenty miles south of Bloody fall, one deposit lying about five miles west of the river and the second seven miles still farther westward. Neither would appear to have any economic value in itself but both indicate a source of copper within the area at large. Prospecting operations in this area would call for the backward tracing of the glacial flow to the source of copper and would be the work of a geologist rather than a prospector. Doctor August Sandberg, who visited the valley of the Coppermine in company with Mr. George M. Douglas, in 1911, made a reconnaissance of the valley of the Coppermine to the south and west of the areas just described. His report, which is reprinted in Vol. XI, *Canadian Arctic Expedition, 1913-18*, is most interesting but would not appear to rank the district covered as being as promising a prospecting field as the Bathurst Inlet area.

PART III

INVESTIGATIONS, 1930

INTRODUCTION

Early in the spring of 1930 it was realized by the Department of the Interior that, owing to increased interest in mining in the North and to the throwing open on July 1 of the Coppermine mineral reservation, there would be extensive prospecting by mineral exploration companies in areas immediately east of Great Bear lake and in the Coronation Gulf district. Owing to this and to other activities, several officers of the department were sent into that part of the country to facilitate the work of prospectors as well as to carry on regular administrative operations. The Director of the North West Territories and Yukon Branch, Mr. O. S. Finnie, instructed the writer to spend the first part of the summer season in these areas and then to proceed to King William island and Boothia peninsula, and, while at the latter to investigate statements contained in a document in the possession of the Department of the Interior purporting to indicate the location of the grave of Sir John Franklin and the possible depository of important papers of the expedition. This document* was compiled by Mr. George Jamme, of Nome, Alaska, from statements made to him by the late Captain Peter Bayne, who for a time had been a member of Hall's expedition of 1864-69.

As it would be quite impossible to complete this program by using the ordinary means of transport, an arrangement was entered into by the Department of the Interior with the Western Canada Airways, Limited, to supply aerial transport. An aerial camera was supplied by the Department of National Defence for the purpose of carrying an aerial track survey along the routes travelled.

On June 14, 1930, the writer left Ottawa and proceeded by rail via Winnipeg and Edmonton to Waterways, Alberta. Here steamer was taken for Fitzgerald, whence the transfer by motor car to Fort Smith, the head of navigation on the Mackenzie system of waterways, is but sixteen miles. As previously arranged, the journey northward from that point to Norman on the Mackenzie river was made in the departmental gasoline schooner *Medico* in company with other officers of the Department of the Interior. The *Medico* was being taken down to Aklavik at the mouth of the Mackenzie river to be used by the medical officer of the North West Territories and Yukon Branch as a hospital ship in covering his district.

Four days after reaching Norman by boat the aeroplane that had been arranged for, arrived and on July 16 the writer was flown to Hunter bay at the east end of Great Bear lake, where a stop was made to examine some outcroppings of copper sulphides (bornite and calcocite). Later in the day the route from Hunter bay to the mouth of Kendall river and then on to the mouth of Coppermine river was photographed, the plane arriving at the latter point about 5 p.m.

A few days were spent at Coppermine in laying out and superintending the construction of ditches and anchor pits on the proposed site of the wireless station.

* See Appendix C.

On July 20 a reconnaissance survey of the south and west coasts of Coronation gulf was undertaken in an open gasoline motor boat. Accompanied by an assistant to run the engine, the writer followed the southern coastline from Coppermine in the west to Detention harbour in the east; then, returning north-westward by trading schooner, he continued, in his small boat, the examination of the west coast from Cape Krusenstern back to Coppermine. On this survey there were frequent landings with short trips into the interior. The Richardson river was ascended for forty miles. Harbours were examined and changes of the geological formation and general topography were noted.

Concluding this part of the season's work at Coppermine, a trip was made to Bernard Harbour to utilize the wireless apparatus on the Hudson's Bay Company's ship *Baychimo* in connection with matters concerning the remainder of the operations. On August 26, after vexatious delays due to engine trouble, the start by aeroplane was made for King William island, Boothia peninsula and the magnetic pole. Landing at two points on the west coast of King William island the area between Victory point and Lady Jane Franklin point and that adjacent to Terror bay were examined for graves and records of Sir John Franklin's expedition. A number of relics were found but no discoveries of importance were made.

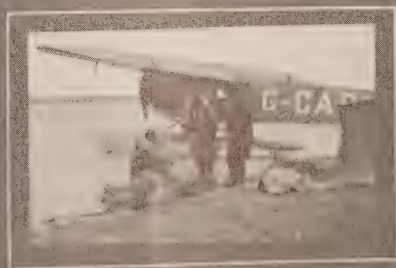
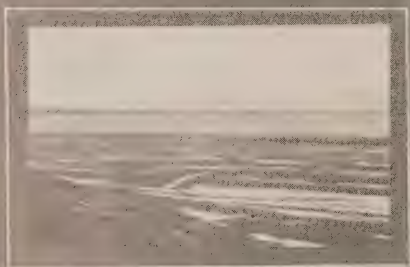
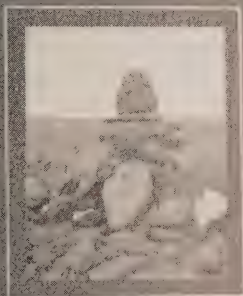
Throughout the aeroplane journeys aerial photographs were made of nearly two thousand miles of coastline, which will be of service in checking up existing maps of the region. The return by aeroplane was begun on September 7 and after an overnight stop at Cambridge Bay, Coppermine was reached on the afternoon of the 8th. On the 9th the homeward trip was continued by way of Hunter bay and Rae to Fort Smith. The journey from Fort Smith to Edmonton and on to Winnipeg was also made by air transport, and the remainder of the journey to Ottawa by rail. Accounts of the several investigations are given in the following pages.

MINERAL INVESTIGATIONS

For nearly two hundred years the world has accepted the valley of the Coppermine river as a potential source of copper. Native copper implements, the handiwork of the local Eskimos, had occasionally found their way to the trading outposts then located far to the south of the Arctic coast. These evidences, together with the tales that accompanied them, prompted Samuel Hearne to undertake an examination of the Coppermine valley. This in 1770-72, he followed to the northern coastline. His reports would not indicate that he personally discovered any major deposits of copper or copper ores, but the stories of mineral wealth persisted. Few white men visited the Coppermine during the nineteenth century but specimens of native copper from that area continued to find their way to civilization and the tales of a wealth of copper still lived.

During the first quarter of the present century much of the Coronation Gulf district was examined by government geologists and others, but, although many occurrences of native copper and copper-bearing rocks were observed, no concentration of native copper or of copper ores was reported.

It was not until the aeroplane had found its place as an aid to mineral exploration that promising concentrations of copper ores were located in the valley of the Coppermine river and in the adjoining country lying to the westward. In 1928 several aerial mineral exploration companies operated in the more easterly areas of the Northwest Territories, where they met with but little encouragement. In 1929 the advance guard of these companies reached the valley of the Coppermine and the eastern end of Great Bear lake where indications of some promise were found. The spring of 1930 saw four well-equipped



ON KING WILLIAM ISLAND, SEPTEMBER, 1930—1. View from Lady Jane Franklin Point looking north. 2. Small cairn built on campsite near Victory Point. 3. Looking south from Lady Jane Franklin Point. 4. Cairn between Victory and Franklin Points as rebuilt on Sept. 6. 5. Franklin Point cairn as found on September 6. 6. Camp near Victory Point, September 6, 1930.

organizations established in this area and by fall each had discovered and located deposits of copper sulphides. As yet, these deposits are all but undeveloped, but, should they live up to their first promises, much may be expected of them.

During July, 1930, when the writer visited Hunter bay, which is the eastern extension of Great Bear lake, this area was most active. What appears to be a great fault strikes from Hunter bay northeasterly to the Coppermine river, a distance of forty-five miles, and along this fault several concentrations of calcocite and bornite ores had already been discovered. At the western end of the fault, along the north shore of Hunter bay, an almost continuous line of calcocite and bornite float gave promise of important ore bodies in the immediate vicinity. Two cross cuts along this line uncovered ore in place for a width of approximately twenty feet but the heavy overburden still solidly frozen made development slow and costly. It is hoped that the coming season will see the examination of these properties advanced to a point where an approximation of their value may be arrived at. Further to the northeast two other groups of claims have been located, each with promising outcroppings to justify them. On both of these more development is necessary before any definite statement as to their extent can be made. Later in the season a similar deposit was discovered in the area lying northwest of Dismal lakes. Here one cross cut uncovered eighteen feet of high grade copper ore and a second showed similar ore for a width of six feet. Neither of these cross cuts found both walls of the lode.

In the Hunter Bay area strong indications of cobalt and uranium ores with economic possibilities were also found.

During August, 1930, the northern section of Bathurst inlet was examined, but, while occurrences of native copper finely disseminated throughout the rock are widespread, no concentration of economic importance has yet been reported.

EXAMINATION OF CORONATION GULF AREA

An important part of the season's work was the reconnaissance trip along the coast of Coronation gulf. Beginning at Coppermine the survey was first carried easterly to Detention harbour. The party was then moved to Cape Krusenstern by trading schooner and the examination continued from there back to Coppermine. For this purpose a small open boat, fitted with a gasolene engine, was secured and arrangements made for the services of an assistant to act as engineer.

EASTWARD TO DETENTION HARBOUR

Leaving Coppermine on the evening of July 20, the coastline was followed eastward throughout the night, Kugaryuak being reached early the following morning. This coastline is low and rather uninteresting. Twelve miles east of Coppermine a fairly large stream enters Coronation gulf on the lower stretches of which good fisheries exist, which are utilized by both Eskimos and whites. This stream can be easily identified by a large fish-house, the property of the Hudson's Bay Company, which is located at its mouth.

For approximately twenty miles east of Coppermine there are a number of islands lying along the shore. These are composed of basaltic rocks similar to the ridges which cross the valley of the lower Coppermine river. This area has been examined by some of the mineral exploration companies that have operated in the Coppermine district. From the eastern end of these islands to Kugaryuak river the coast is exposed. It is low-lying and presents few features of interest. No mineralization of economic promise has been reported but its low hills, separated by wide grassy valleys, may some day provide a range for

reindeer. At the mouth of the Kugaryuak river the Hudson's Bay Company operates a small fur-trading post. The Eskimo trail leading from the coast to the interior, which serves the western section of Coronation gulf, follows the valley of the Kugaryuak river, making the mouth of this river an important camping ground for the native caribou hunters.

Kugaryuak was reached at 10 a.m. on the 21st. Two white men, employees of the Hudson's Bay Company, were the only residents at the time of our visit. During the evening the trip was continued to the eastward. After a run of twenty-five miles we camped for supper at the mouth of a stream about twenty miles west of the mouth of Tree river. A few islands lie along this section of the coastline, those lying toward the western end of the area being basaltic while the more easterly group is composed of Pre-Epworth granite. About midway along this run the geology of the mainland changes from the Coppermine series to Pre-Epworth granites.

During our supper hour on shore a strong wind- and rain-storm developed which held us in camp until the afternoon of the 27th. This period was spent in making short trips into the interior. The country is composed of wide, grassy valleys lying between low but very rough Pre-Epworth granite ridges. The only animal life seen consisted of Arctic hare and ground squirrel, the bird life being represented by ptarmigan, a variety of sea gulls, and several kinds of smaller birds. The granite ridges are in places cut by quartz dykes, some of which showed traces of iron sulphides. No copper stains were seen.

Proceeding from this camp at 4 p.m. on July 27 the coastline was followed easterly throughout the night. The Pre-Epworth granites continue for about ten miles beyond the camp where they are for a short distance replaced by dolomitic limestones. The limestone area is low and slightly rolling and while it apparently extends some miles to the east and southeast, it shows for only about two miles along the coastline. From that point (roughly twelve miles west of Tree River harbour) typical basaltic rocks are in evidence, these in many places rising vertically from the water to a height of fifty feet. A few miles west of Tree river a permanent Eskimo home was visited. It consisted of a small cabin built of rough lumber and old canvas and a frame-and-canvas cache. The owner was not present but the camp had evidently been abandoned only temporarily.

Tree River, which has been abandoned as a trading post, was passed without a stop and the coast followed to a point twelve miles beyond, where an outstanding cairn was examined. This cairn was probably erected by members of the Dease and Simpson expedition in 1839. Situated on a low rocky point, built of flat slabs of limestone, it rises about twelve feet above the ground and is surmounted by a large stone which must have taxed the ingenuity of the builders to place in its present position. Along the coastline between Tree River and Hepburn island basaltic rocks predominate, although at the lower ends of several of the inlets the Pre-Epworth granites show. From Grays bay to Detention harbour the formation of the shoreline and the islands is granite. Throughout this area there are numerous islands and reefs and the coastline is most irregular. Several good harbours exist but great care must be taken when approaching land. Inside several of the harbours good shelter from any wind is obtained.

During the past summer evidences were found of the existence of a small band of musk-oxen in an area lying about seventy-five miles south of Grays bay. This country is rugged and rather inaccessible and as the eastern end of the granite areas is approached rises to a considerable height. Along the coastline from cape Barrow to Detention harbour granite hills rise steeply from the water.

Detention harbour is large and well protected, with an inner harbour where smaller boats can be safely anchored in any weather. This point has been the headquarters of one or more white trappers for several years past and has been a profitable base for their operations. The maps showing a large island lying in the entrance to Detention harbour are incorrect as there is no passage eastward along the southern side of the harbour.

The country from cape Barrow to Detention harbour consists of very rough granite hills which rise to possibly 700 feet. Two types of granite are noticeable in this area. Immediately south of the harbour the country becomes lower but is still composed largely of granite in which a fair amount of galena is to be seen. On the day of our arrival, a local trader had located eighteen mineral claims on the mainland and islands lying east and south of the entrance.

While inspecting the harbour in our motor boat the engine failed and we found, upon investigation, that new parts would be necessary to put it in action. Shortly after our accident we met the motor boat belonging to the schooner *Nigalik* and were towed to a small harbour four miles south where the schooner was at anchor. As we were now without motor power we decided to join the *Nigalik*, which was proceeding westward within the hour with Cape Krusenstern the first stop. This run was made during July 28-29, Cape Krusenstern being reached at 4 p.m. on the 29th. Here we disembarked, having secured a new outboard motor from the schooner's stores.

CAPE KRUSENSTERN

At Cape Krusenstern we found a large native settlement. The people living in canvas tents were clustered around two small trading posts. This community appeared to be in good circumstances and the people were, at the time of our visit, living largely on fresh-water fish secured from lakes lying a few miles to the westward. A good collection of native photographs was secured.

During the forenoon of the 30th we proceeded south and west along the coastline, and camped for the night on cape Hearne. This coast is low and flat for some distance inland, being composed of wash gravel and glacial clays. During the late spring and early summer it is the rendezvous of a number of native families who spend that season in seal hunting. Continuing our trip on the following morning, Cape Kendall was passed during the early forenoon and the northern coast of Richardson bay followed to its western extremity where a camp was made at the mouth of Richardson river. Here we found a white trapper with two Eskimo helpers. He had spent the previous winter trapping in this area and was employing the summer in securing a supply of dry fish for the coming season. At the time of our visit the run of fish had fallen off but earlier in the season the stream had been most productive.

RICHARDSON RIVER

It had been our intention to return to Coppermine on August 1, but high winds made this impossible. The day was spent in an examination of the country, which was found to consist of wide grassy flats with occasional low ridges composed of rocks of the Coppermine series. A few miles up the Richardson river a large nesting ground of white-fronted geese (*anser albifrons*) was observed. In the sheltered areas willows standing about three feet high were not uncommon. During the afternoon Richardson river was ascended for a distance of about forty miles. Willows and vegetation of all kinds increased in size as the coastline was left behind, the willows developing into trees measuring twelve to fifteen feet in height. Very fresh signs of moose were seen at two points and we were informed that these animals were not uncommon from that point southward. On returning to the mouth of the river the trapper showed us a small

patch of potatoes which appeared to be doing quite well. These had been planted in the open on a low silt bar and had not been protected from the weather at any time. An examination showed that some at least of the potatoes had developed until they were the size of a hen's egg. It would appear that, with care, small gardens in this area might be made productive.

During the evening of August 2 the wind, which had blown strongly from the northwest since our arrival at Richardson river, moderated, which enabled us to make the run to Coppermine during that night. Owing to the uncertainty of the date of the arrival of the supply ship *Baychimo*, no work involving any long absence from Coppermine was possible. It was necessary to take advantage of the wireless apparatus of the vessel in order to get into touch with the airways company which was to transport us to King William island and vicinity. After a few days spent at Coppermine an opportunity presented itself to proceed to Bernard Harbour, and that point was reached on August 8. The following day was spent at Bernard Harbour where a number of trappers and traders had gathered to meet the supply ship. While here we were able to secure well developed radishes and lettuce which had been grown locally by the agent of the Hudson's Bay Company.

When the ss. *Baychimo* reached Bernard Harbour, a wireless message was sent regarding details of the aeroplane journey and passage to Coppermine was taken on the ship as described in the section dealing with the Franklin investigations on King William island.

ESKIMO SETTLEMENTS INSPECTED

Nearly all the Eskimos living along the mainland coast of Canada between Coppermine and Adelaide peninsula spend the summer season far inland. With the exception of some seventy-five natives who remained for the 1930 season at the fisheries on the lower Coppermine, no Eskimos were seen by us on the south coasts of either Coronation gulf or Queen Maud gulf.

The greater part of the Coppermine Eskimos spent the early summer at Bloody fall, where they were most successful with their fishing. Later in the summer all of this band moved their camps to the mouth of Coppermine river where they continued their fishing.

At Cape Krusenstern, which was visited on July 29, about 125 Eskimos were camped, having come ashore from their spring sealing camps which had been located on the salt-water ice some miles off shore. This band had also been successful in their trapping during the previous season and needed only food to make them content. This they obtained in sufficient quantities from the fresh-water lakes a few miles west of their settlement, where a good supply of fish can generally be secured.

A visit was made to Rymer point (south coast of Victoria island) on August 10. Here an Eskimo settlement of about 175 persons was found. This band had been wonderfully successful in their trapping operations and could be, from an Eskimo viewpoint, considered wealthy. They had purchased practically the complete stock of two trading posts. All were well dressed in imported clothing and each family was well equipped with new tents and domestic utensils. Many still had a supply of imported food which they supplemented with fish and seal. Only one other Eskimo settlement was visited. This was located at Cambridge Bay, where about forty natives were camped around the trading posts. These people had also been fortunate in securing a good catch of white foxes and appeared to be in prosperous circumstances. Their summer diet consisted of fish and seal. The greater part of this band was located some miles to the westward where a good summer fishery exists. This camp was, however, only seen from the air.

In summing up the native situation for the territory between Coppermine river and King William island, it may be said that they enjoyed a prosperous year. It would appear that the winter season 1929-30 was an exceptionally good one for the native trappers, white fox being plentiful throughout the country. This enabled the people to buy more than their usual quantities of imported foods, while the local supply was if anything better than the average.

FRANKLIN INVESTIGATIONS, KING WILLIAM ISLAND

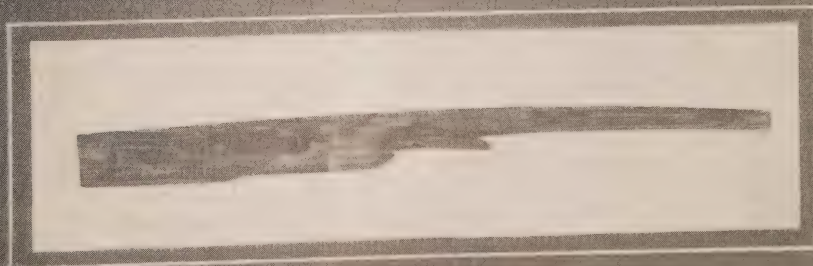
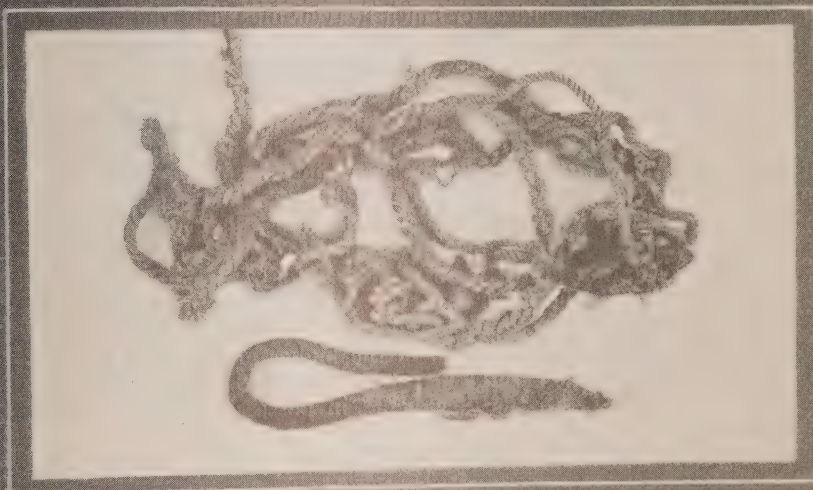
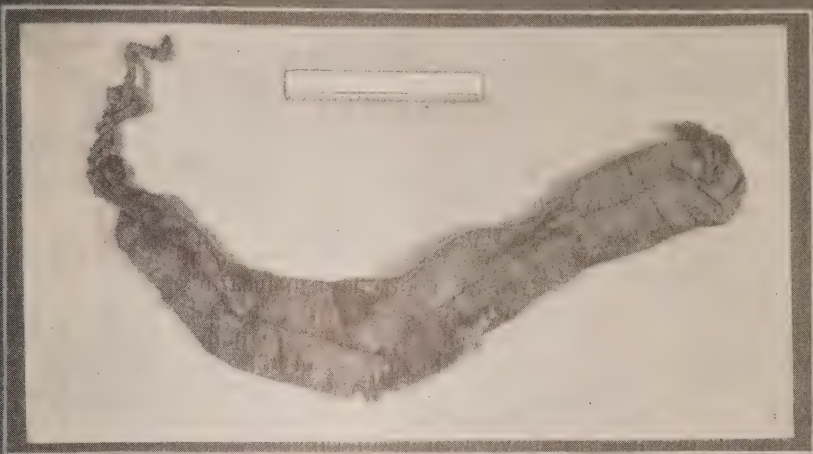
On August 9 we left Bernard Harbour on the *Baychimo* for Coppermine. A stop was made at Rymer point, Victoria island, and our destination was reached on August 13. On the following day an aeroplane arrived, as previously arranged by the department, to carry the party from Coppermine to King William island. The first duty of the crew, however, was to salvage one of the planes abandoned by the McAlpine party at Dease point during September of the previous year. This operation was successfully carried out, as the plane was found to be in perfect condition after more than eleven months of exposure to the Arctic weather. It was, in fact, this salvaged plane that finally carried us over twenty-five hundred miles to King William island and back to civilization.

The original intention was that a plane known as the "CASM" should be used on this work, but, although a new engine had been fitted to it to insure the success of our trip, mechanical trouble developed which made any flight into the more or less unknown quite out of the question. The salvaged plane, the "CASK" had gone south to McMurray. After the failure of our engine, everything was at a standstill until August 26, when the "CASK" returned from the south. During the same day our load was transferred to the "CASK", and the trip to the north and east undertaken. A stop for the night was made at Bernard Harbour which eventually lengthened to a stay of nine days. Throughout this time flying was impossible on account of fog, rain, and high winds.

On September 4 the weather cleared and an early start was made from Bernard Harbour for Cambridge Bay. The aerial camera was operated throughout this flight, which was completed in slightly over three hours. A stop of one hour was made at Cambridge Bay, and the flight was then resumed and Gjoa Haven reached in three and one-half hours, photographs being taken throughout the flight. At this point Mr. Richard Finnie, special investigator of the Department of the Interior at work in the North, by prearrangement joined the party.

EXAMINATION OF VICTORY POINT

After a night spent at Gjoa Haven the party proceeded along the east coast of King William island until Sir James Ross strait was reached. It had been hoped that some definite information would be secured concerning the wrecked ship reported to the writer by a number of the natives during the two previous occasions upon which he had visited King William island, which could scarcely be any other than one of the Franklin ships, either the *Erebus* or the *Terror*. Unfortunately the whole sea area from the southern limits of the Matty Islands archipelago was covered by heavy flocs, and in addition the Blinkey Island area (where the wreck was supposed to lie) was hidden by heavy cloud-banks through which only occasional glimpses of the islands and ice flocs were obtained. These conditions rendered a landing or an examination from the air impossible. When these conditions developed the flight was continued to the magnetic pole on Boothia peninsula and from that point to cape Felix and on to Victory point, both on King William island. At Victory point a landing was effected



RELICS FOUND AT FRANKLIN CAMP BETWEEN LADY JANE FRANKLIN AND VICTORY POINTS.
 SEPTEMBER 6, 1930—1. Part of man harness for hauling sled, photographed with six-inch rule
 for comparison. 2. Fragments of light cordage. 3. Small oak barrel stave.

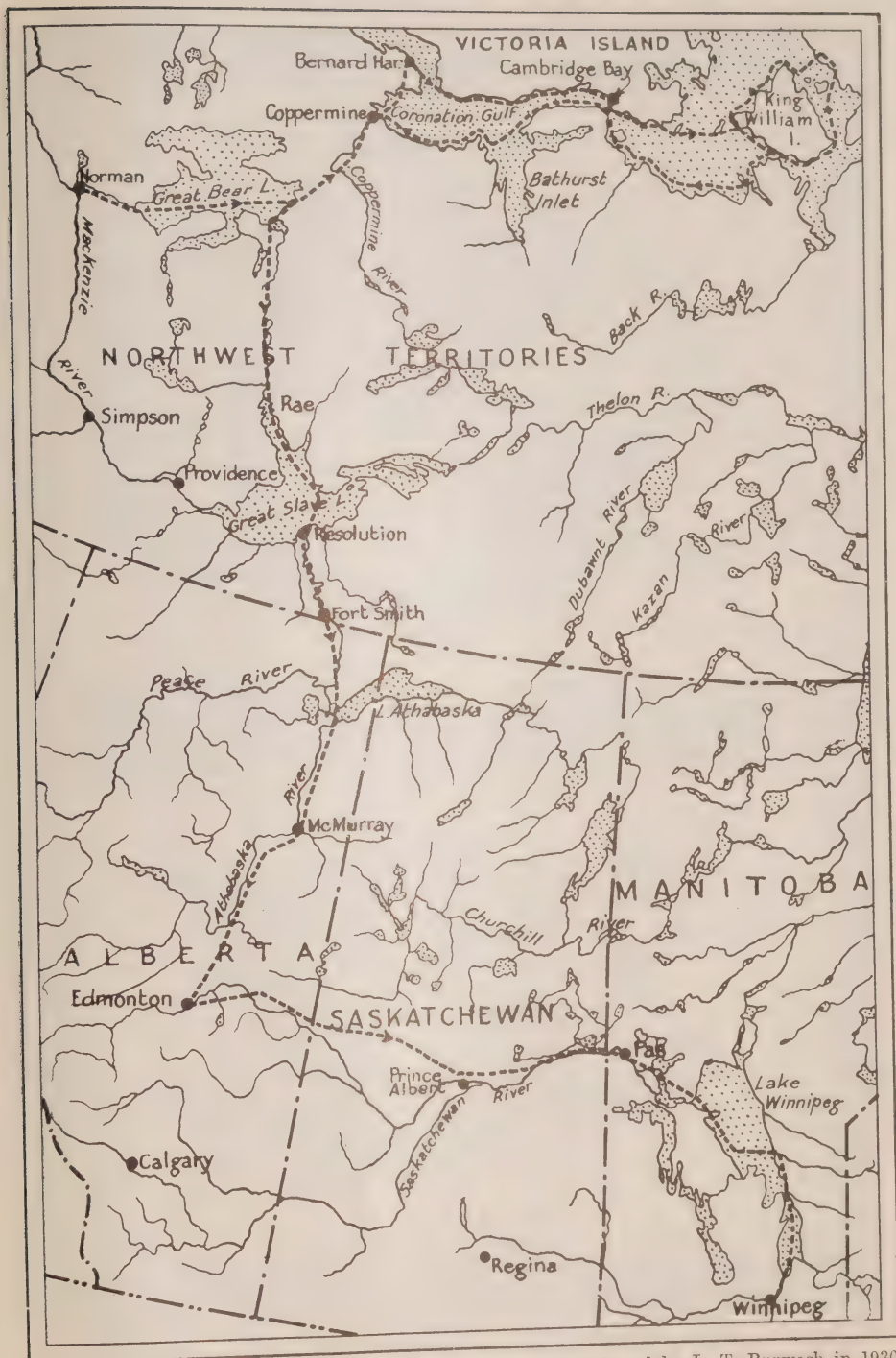
and camp made on September 5. All four members of the party worked throughout every hour of daylight in investigating the coastline from north of Victory point to Back bay. The pilot and the mechanic worked half a mile inland while Mr. Finnie and the writer followed the coastline. Evidences of a Franklin camp were found, consisting of what had evidently been stone caches and possibly walls of a rectangular tent. This was the area in which the one known written record of the Franklin party was found by Lieutenant Hobson, who was associated with M'Clintock on their trip during 1858-9. We, however, found nothing here except the stone structures.

The following morning Mr. Finnie and the writer examined the coastline northward to Victory point. We were fortunate in locating a cairn which had not been previously examined, but, upon taking the cairn down, were rewarded with specimens of blue naval broadcloth only. At a point opposite this cairn but close on shore we located what had evidently been a fairly large camp where more broadcloth, the remains of a linen tent, a number of ropes of various sizes and a small barrel stave, a piece of what appears to be imported coal, and the rusted remains of what may have been a knife blade, were found. These have been brought to Ottawa.

No rock in place was found in this area, the country consisting of dolomitic limestone shingle with ridges of much heavier blocks of the same material lying back from the shoreline. Igneous rock boulders occur in the drift but are not plentiful. On some of the more protected flats a light deposit of vegetable mould exists, which is sparsely covered by coarse grasses. There are no elevations along this coastline of more than thirty feet, the country rising in a series of low beaches until the heavier and rougher ridges are reached. The summer floe ice has pushed far back on the land in many places, pushing up a great many mounds of gravel and shingle, and in places of heavier material which, from their appearance, might almost have been the work of man. The higher beaches which lie above the effect of the ice floes are most regular in their formation and can be examined for traces of human occupation quite readily, but in the lower areas an army of men might work without exhausting the possibilities of finding relics or records. The area embracing Victory point was fortunately included in the higher ground and consequently easy of examination, and a careful investigation failed to show any trace of cairns or graves, as stated in the document* in possession of the Department of the Interior.

Farther to the south on Lady Jane Franklin point, evidences of stone structures, which may have been cairns, caches, or tent foundations, were seen but all of these had been overhauled by earlier parties and were devoid of any relics of the Franklin party. The distance between Victory point and Lady Jane Franklin point is approximately five miles, a fairly deep bay separating them. When examining the area around the head of this bay a cairn was found which had not, apparently, been examined by those previously visiting this area. This cairn was carefully taken down until the ground area covered by its base was completely exposed. A square of naval uniform cloth had been placed on the ground and the cairn built over it. The gravel below this cloth was dug up but nothing was found under it nor did an examination of the ground within a radius of ten feet of the cairn produce any relic left by the Franklin party. The uniform cloth found under the cairn had been lying for many years in a damp and shaded spot so it had become little more than a mass of pulp, the only thing about it remaining intact being its colour. Short fibres could be identified and occasional small fragments could be separated which showed the texture of the cloth. After making an examination the cairn was rebuilt on its former site as it might, at some future date, serve as a datum point for further investigations.

* See Appendix C.



Map of a portion of Western Canada showing aerial route followed by L. T. Burwash in 1930.

This cairn was located about 600 feet back from the water's edge and stood on a low, shingle beach about fifteen feet above sea-level. Almost immediately in front of it, and within thirty feet of the shoreline, a series of quite regular gravel mounds were found. While they resembled a great many others that are to be found along this coastline, it was decided to examine one or more of them. This work proved unproductive, the mounds having no doubt been pushed up by the floe ice. While working on these mounds, however, some rags of naval uniform cloth were noticed half buried in the shingle of the beach. These lay a few feet from one of the mounds examined and, upon a careful examination of the ridge, or first beach, upon which we were, other evidences of the former presence of white men were secured. These consisted of small cordage, an eleven-foot section of one-inch rope, many scraps of uniform cloth and linen tent cloth, two small oak barrel staves, a small quantity of imported coal (burned on one side), samples of rusty iron which may have been parts of the blade of a long knife and a strip of linen cloth twelve feet long and ten inches wide which had evidently been the lower part of a tent. These were all carefully collected and have been brought to Ottawa. The relics found at this place were scattered over possibly 300 feet of coastline along the crest of a low shingle ridge, such as would naturally be selected as a camping ground. No other signs of white men were found along the coast north of this campsite, including Victory point.

AT TERROR BAY

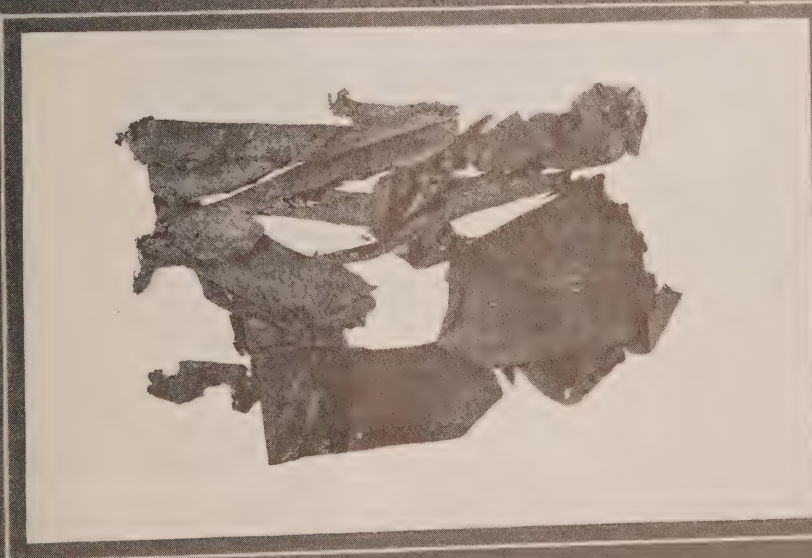
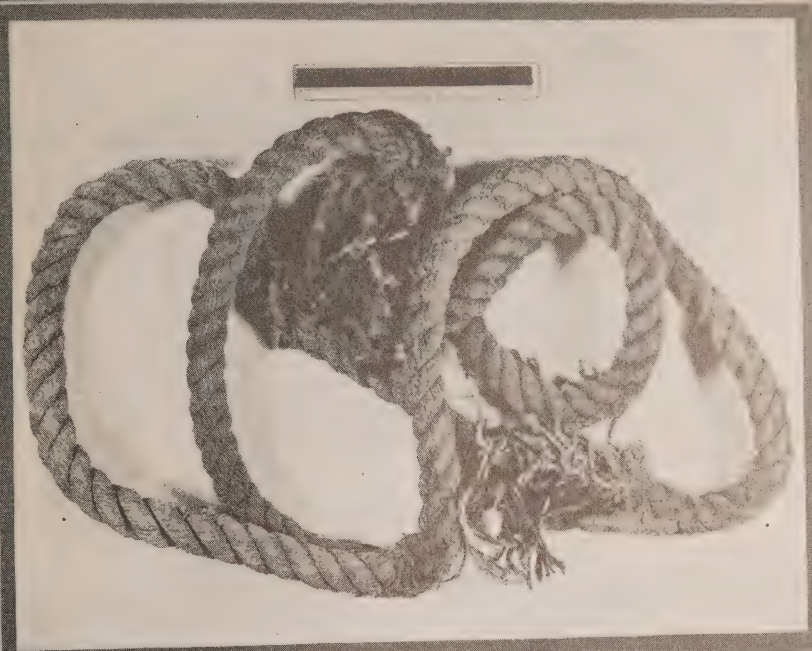
Our camp on Victory point was left during the early afternoon of September 6 and the trip continued southward along the west coast of King William island. During this time, and in fact during the latter part of the flight made on the previous day, the sea had been covered by floe ice which made a landing impossible except at the point near Victory point, where we had made our night camp. At Terror bay clear water was found and a landing made and this coastline examined. It was here that Schwatka reported a hospital camp and native stories concerning papers which might have been of value. At this point a short examination of the coastline resulted in the finding of one grave which may have contained two or more bodies. This was carefully rebuilt but no other evidences of the Franklin party were seen. This area is much similar in structure to that examined at Victory point with the exception that gravel mounds, due to ice or frost action, appear to be much larger; too large in fact to have been the work of a party travelling the coast.

THE RETURN FLIGHT

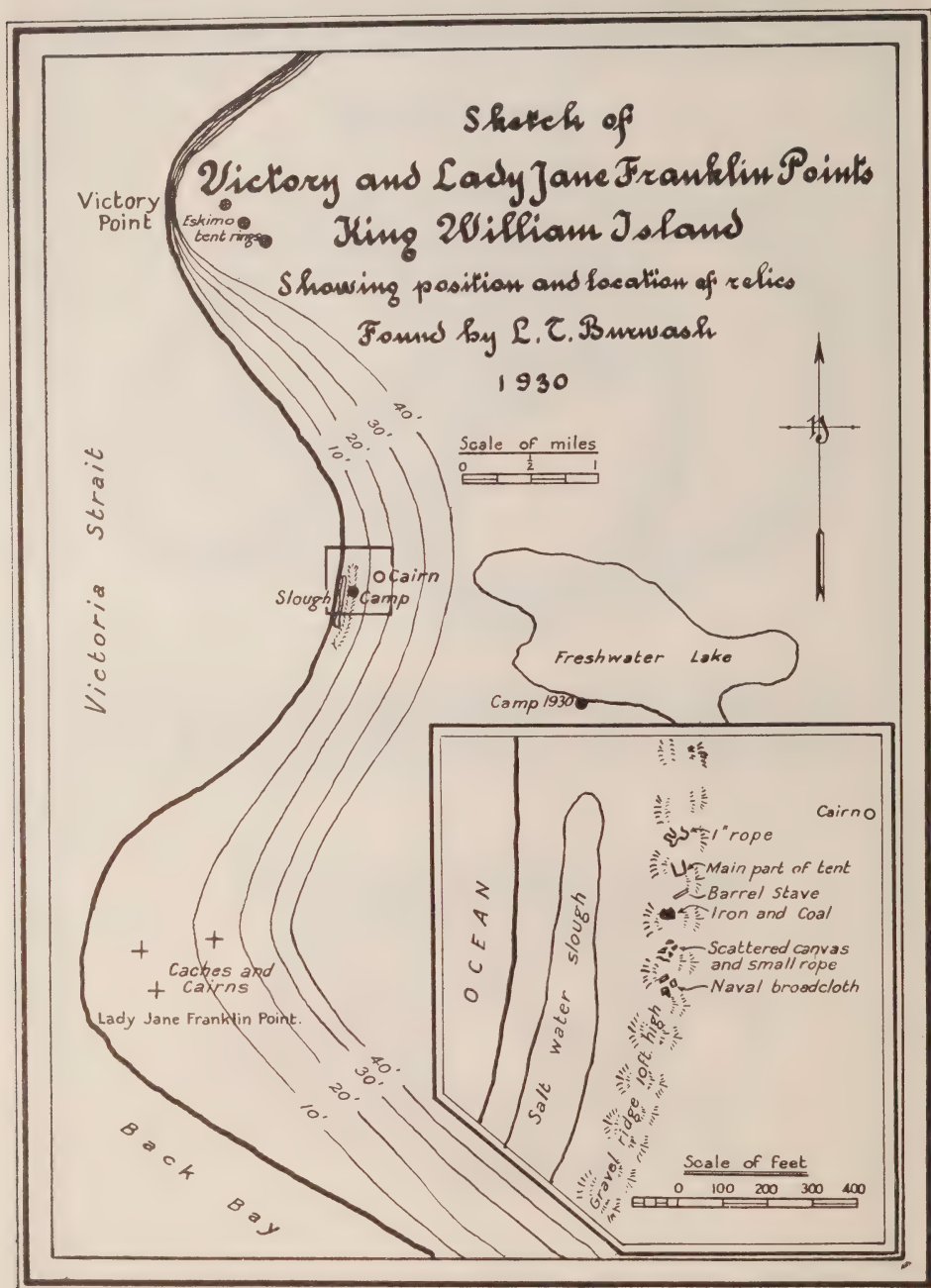
Having completed our investigations at Terror bay the party returned to Gjoa Haven where the night was spent. Mr. Finnie remained at this post to continue his work. At 7 a.m. on September 7, after refuelling, the return flight westward was begun from Gjoa Haven. A photo-traverse was made along the mainland coast, and we landed for the night at Cambridge Bay. On the 8th the flight was continued to Coppermine which was reached at 1.50 p.m.

Conclusion.—A number of cairns and graves lying along the south coast of King William island were examined during the two previous trips made by the writer, but these had been overhauled by others and did not appear to contain any record or relic of value.

In conclusion it may be said that there is still a chance that records of the Franklin party exist on King William island but, from experience gained in this area during three visits, the writer is of the opinion that even if such records exist an extensive and systematic investigation by a party of many persons would have to be most fortunate to locate them.



1. Length of one-inch rope found at Franklin Camp. (Compare six-inch rule). 2. Fragments of naval broadcloth found at Franklin Camp.



AERIAL PHOTOGRAPHY

An aerial camera, with an ample supply of film, had been secured from the Department of National Defence for the purpose of making a track survey of the routes travelled by air. This phase of the work was somewhat in the nature of an experiment as the instructions were to travel on all flying days without



1. Part of linen tent found at Franklin Camp. (Compare six-inch rule). 2. The author with relics found September 6, 1930.

special regard to photographic conditions. As nearly 2,000 miles of coastline was photographed under these conditions, the results may be taken as a fair average of what may be obtained in the North by adding an aerial camera to the equipment of any party travelling by air during the summer season. Throughout the trip no time was lost due to delay on account of unfavourable photographic conditions, so the photographs secured can reasonably be said to have cost the Government nothing beyond the cost of material used. As a matter of fact the conditions prevailing during the days occupied in air travel were rather below average. The sky was often overcast and frequently low clouds and fog banks obscured sections of the country.

The net results showed that of some 2,000 exposures made, about 1,700 will be of service in a study of the physiographic features, the surface cover and drainage of the area along the route travelled and in supplementing the sketchy information shown on existing maps.

The first aerial photographs taken during the trip covered a line from Hunter bay (eastern end of Great Bear lake) to a point on the Coppermine river twenty-five miles north of Kendall river. This work was done under poor photographic conditions but the results were much better than anticipated.

From the time the plane left Bernard Harbour for King William island and points east, a continuous series of photographs was made throughout the entire flight until the party returned to Coppermine on September 8. During the above five days only two were really suited for aerial photography but the results showed nearly 90 per cent of useful prints. Later Bloody fall was photographed from a low altitude with good results, and during the flight from Hunter bay via Rae to Great Slave lake much useful scenic photography was done.

The following coastlines, islands, and harbours were covered by the survey:—

Hunter bay to Kendall river (across country).

Bernard Harbour to Cape Krusenstern, to Lady Franklin point, and along southern Victoria island to Cambridge bay.

Cambridge bay along southern Victoria island to Lind island; across Victoria strait to the Royal Geographical Society islands to cape Crozier and along south coast of King William island to Gjoa Haven.

The southeastern and eastern coastlines of King William island to the Matty islands and the western coastline of Boothia peninsula to cape Adelaide (magnetic pole).

Northeastern coastline of King William island from port Parry to cape Felix and the northwestern coastline south of Victory point.

Western coastline of King William island from Victory point to cape Crozier and on to Terror bay.

The northern coastline of Adelaide peninsula from cape Geddes to Grant point.

The western coastline of Adelaide peninsula from Grant point to O'Reilly island and across McLoughlin bay to Stewart point.

The south coast of Queen Maude gulf complete, Melbourne island and the eastern coast of Kent peninsula.

Simpson rock at entrance to harbour at Cambridge Bay.

Northern coast of Kent peninsula complete to cape Flinders on the west, across north end of Bathurst inlet to cape Barrow and along southern coast of Coronation gulf to the mouth of Coppermine river.

The eastern end of Great Bear lake from Hunter bay to its southeastern angle and 100 miles south across portage to Fort Rae.

APPENDICES

APPENDIX A

GENERAL NOTES ON AREAS COVERED, 1925-26 AND 1928-29

NOTES ON NATURAL RESOURCES AFFECTING MINERAL DEVELOPMENT

The country south of Coronation gulf and west of Bathurst inlet is well served by rivers of considerable size. The chief among these are the Rae, Coppermine, Tree, Hood, and Burnside. All of these rivers are similar in type. They have their sources on the height of land to the south from whence they flow across a series of plateaus with rapids marking the fall from one general elevation to the next, until points within a few miles of the salt water are reached. Here, each river makes its big drop to the sea and on each, where it cataracts over the last barrier before reaching the sea, a good head of water can be obtained and large storage basins can be developed immediately above the head of the falls. In the Coppermine and, possibly, the Tree river, the winter flow is of sufficient volume to ensure enough power for any operations that are likely to be undertaken for some time to come.

Sand and gravel for general building purposes are available, as is an ample supply of rock for roads or railways. Fresh meat and fish appear to be in some abundance and the supply necessary for a small industrial community could be obtained without injury to the herds of caribou or the local fisheries.

On the negative side of the account lie fuel, lumber, and an ensured water supply. The first two of the above, fuel and lumber, are, from an economic standpoint, non-existent in the area itself, but low grade coal might be brought from the known deposits on the southern coast of Banks island. The assurance of a winter water supply for an industry of any magnitude at any point far removed from one of the larger rivers is at least in some doubt as it is a question just how far water can be piped during winter weather.

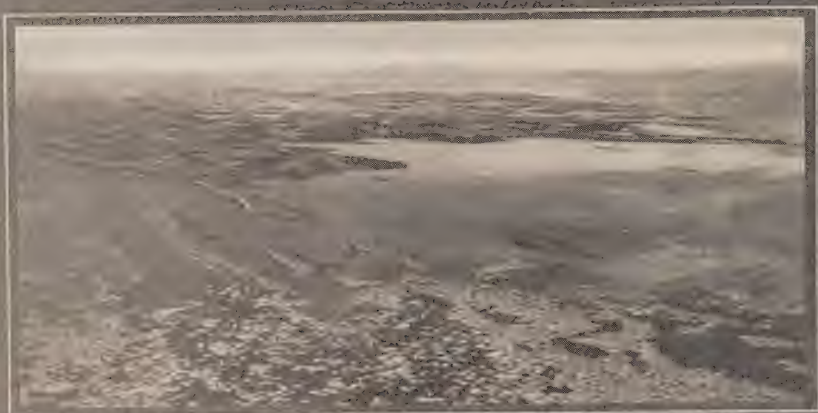
CASUAL LABOUR

No white casual labour is in the market. The local Eskimos would do much to assist in the manual labour necessary to develop mineral wealth but it should be borne in mind that Eskimos so employed during the summer months only, unless they were well paid and their wages expended to the best advantage, would enter their long winter season under a decided handicap as they would be without fur clothing, caribou meat, or fish.

NOTES ON GEOLOGY

The known geological data concerning the Northwest Territories have been secured from several sources. The first notes on geology were supplied by the early British explorers but the more exact knowledge now at hand has been gained chiefly by the Dominion Geological Survey and from the geological notes made by field parties of the Topographical Survey, Department of the Interior. During the past two seasons several mineral exploration companies have operated in the Territories and these will supply a new and important source of geological information.

The geology of the Northwest Territories as indicated on the Canadian Government's charts may be considered as approximately correct in the follow-



AERIAL PICTURES, SEPTEMBER, 1930—1. Part of King William Island, Terror Bay in background. 2. Part of King William Island, looking south from Back Bay. 3. Gjoa Haven, King William Island, site of author's winter camp, 1928-29.

ing areas where reconnaissance surveys have been made: the valleys of the Slave and Mackenzie rivers; the valleys of the Dubawnt and Thelon rivers; the southern coast of Coronation gulf; the northwestern coastline of Hudson bay; the central section of the coastlines of Hudson strait, and the area adjacent to Cumberland gulf in southeast Baffin island.

NOTES ON TOPOGRAPHY

The present topographical knowledge of the Northwest Territories has been derived from three principal sources and one minor source: (1) from instrumental ground surveys, (2) aerial surveys supported by ground observations, (3) track surveys with positions fixed by observations, and (4) by sketches and information secured from natives and others without experience in mapping.

The instrumental surveys have been made by the Topographical Survey of the Department of the Interior and the Geological Survey of the Department of Mines. The aerial surveys have been made by the Topographical Survey in collaboration with the Royal Canadian Air Force. The track surveys, supported by observation, have been made by some early explorers, including the British navigators who first reported the existence of the lands and islands of northeastern Canada—Franklin, Back, and Richardson; the navigators engaged on the various Franklin relief expeditions, and by members of the Dominion technical services. The information secured from the above sources has been supplemented by reports and sketches supplied by travellers, prospectors; traders, natives, and others.

The instrumental ground surveys cover the water route from Fort Smith to Beaufort sea; the Lockhart River watershed; parts of the Talston and Hay rivers; the lower stretches of the Liard and Peel rivers; Great Bear river with the eastern end of Great Bear lake; and parts of the southern coast of Coronation gulf. The aerial surveys so far made cover only parts of Wood Buffalo park in the vicinity of Fort Smith, N.W.T. Track surveys, supported by observation, cover the greater part of the coastline of the mainland, the coastlines of the Arctic islands, and the courses of the principal rivers of the Territories. Much local detail which is shown on the published maps has been supplied by travellers, traders, prospectors, and others.

During 1929 a new source of topographical information developed. Several mineral development companies have extended their radius of action to include parts of the Northwest Territories and some of these have undertaken both track and aerial surveys of the fields in which they operate and have supported both methods by a limited number of observations. The areas affected by the information acquired by the mineral development companies are: first, that part of the western coast of Hudson bay lying between Chesterfield inlet and Eskimo point; and second, the watersheds of several rivers entering Batlaurst inlet and Queen Maud gulf from the south. From data secured by Government parties in the field the existing maps will later be corrected in the following areas: Great Bear lake, King William island, Boothia peninsula, and southwestern Baffin island.

NOTES ON PLANT LIFE

At the mouth of the Mackenzie river well developed willows are found on the coastline, which at this point lies in latitude 69 degrees north, and spruce, tamarack, and birch grow within twenty miles to the south. Many other forms of plant life are plentiful throughout the delta area.

From this point the tree line, and with it the northern limit of many of the other forms of plant life, trends southeasterly and eventually reaches the western coast of Hudson bay in latitude 58 degrees north (approximately) or

eight hundred miles south of the Mackenzie delta. The area lying between the northern limit of timber and the Arctic coast has frequently been referred to as the "barren lands", a name justified in some areas but not altogether descriptive of the country at large, as in many parts grasses, heather, and wild-flowers abound. The chief difference between the more fertile areas of the north and more southern prairies lies in the depth of fertile soil which in the south greatly exceeds that of the north.

The shortage of plant life throughout the area at large is possibly due to several causes, the principal being: lack of moisture in summer; high winds which not only retard summer growth but during the winter concentrate the snow in the valleys, leaving much of the surface of the country unprotected; and the lack of animal life and, with it absence of fertilization. It is noticeable that in areas where ground squirrels are plentiful the vegetation is more abundant and the depth of fertile soil greater.

Within this treeless area local conditions greatly affect the development of plant life. At almost any point where the ground lying at not too great a height above sea level is protected from the winds and removed a few miles from a coastline visited by summer ice floes, willows, grasses, and flowers are well developed. This point is well illustrated by the growth at the mouth of Burnside river, which enters Bathurst inlet from the west, where willows four inches in diameter are common and many other forms of plant life flourish, while two hundred miles directly to the south an area unsheltered by hills, and lying at an elevation of approximately 1,200 feet, is all but barren. The fact that this second area cannot be affected by the proximity of ice-floes would indicate that wind, altitude, and lack of moisture are the chief enemies of plant life in the north.

Throughout the Arctic islands much of the country is but sparsely covered with vegetation. In the more sheltered areas rough grasses and hardy flowers are found. Willows are occasionally seen but they seldom exceed one inch in diameter and take the form of a creeping plant sheltered from the winds by the grasses and slight local elevations in the soil or rock.

LAND, SEA, AND AIR TRANSPORTATION

Up to 1929 it was necessary to use one of two routes to deliver either passengers or freight to this district: the first by ship from Vancouver or other Pacific port, to Coronation gulf *via* Bering sea; the second by river boat from Waterways on the Athabaska river to Aklavik and thence by the sea route to Coronation gulf. The rates on both of these routes are more than any ordinary industrial enterprise can pay and there is considerable danger of a partial or total loss of goods shipped on either route. As transportation systems to support mining activities, neither can be considered. The country is not without harbours but in none of them has it been possible to land freight from ship to shore direct.

There are three alternative routes to those in use now in sight: the first would result from extending the Hudson Bay water route to the western end of Baker lake and thence to Bathurst inlet by rail, which calls for railroad construction between points 350 miles apart in a direct line. The second would be an extension of the Hudson Bay railway from Churchill to Bathurst inlet, which involves railroad construction between points 800 miles apart (in an air line). The third is the extension of the Northern Alberta railway (formerly known as the Alberta and Great Waterways railway) from Waterways to some point on Coronation gulf. This involves railroad construction between points separated by 850 miles.

It would appear that the Baker Lake route is the least expensive in regard to construction but it would be at best a five months per year route. The Churchill route would cost less to construct than the extension from Waterways and would lead more directly to smelting and refining centres. The Waterways route, while possibly the most expensive to construct, has to its credit other likely mineral areas along its route which may well be expected to bear their share of the costs of construction and operation.

During 1929 aeroplanes showed that they were a factor in the transportation problem of the Far North and although their first season was not without its mishaps it has already been demonstrated that for light passenger service they are far in the lead. The more northerly basic points for air travel are Baker Lake and Reliance. The first would have a southern connection from Churchill, while Reliance would be fed from The Pas, Prince Albert, and Edmonton. The terrain over which all of these routes lie is wonderfully adapted to either summer or winter flying, but all must surmount the barrier which lies along the height of land between the Arctic and the more southerly waters. Here an eternal conflict is waged between the Arctic and sub-Arctic climates, the resulting conditions being low visibility, ground fog, and low-lying clouds, to which must be added sudden and violent storms, all of which tend to cause delay and add to the hazard of air travel.

The Coronation area is well served by lakes and inlets which afford safe landings for aeroplanes either in summer or winter and good anchorages during the open season. Just what success aeroplanes will meet with in attempting to fly over the untimbered country in the Arctic slope during the winter months is still somewhat of a question as the only experience so far gained along these lines is from a limited amount of flying done by exploration companies in and around the Baker Lake area during the past season. The midwinter handicaps that flying in these areas will carry are: lack of visibility, ground drifts, fogs and landing grounds upon which the drifted snow will constitute a real hazard.

Passing reference has already been made to mineralized areas lying along a possible extension of the Northern Alberta railway to Coronation gulf. These would naturally bear their share of transportation expenses. Already very active prospecting operations have been carried on in the area around the eastern end of lake Athabaska. On one location these operations have already reached the drilling stage. Prospectors have met with encouragement at points along this route as far north as Reliance, which divides the unbuilt section of this route into three almost equal divisions, each with a mineralized area which may carry its own transportation costs. At no point other than in the Coronation Gulf district has a mineralized area of promise been found, north of a line between Stony rapids east of lake Athabaska and Eskimo point on the west coast of Hudson bay. This would indicate that Coronation gulf cannot as yet count on other areas assisting in the cost of possible transportation routes *via* either Baker lake or Churchill.

LOCAL TRANSPORT

The western Arctic year may be divided into two main seasons with two short between-season periods during which travel is impossible except upon the land. From mid-July until early October travel by sea will be possible throughout the greater part of the western Arctic, but the season of navigation is generally somewhat shorter in the waters east of Cambridge Bay. A dead season, in so far as travel by sea or ice, then follows, lasting until mid-November. From that time until late June sled travel on the sea ice is in order, after which a second between-season period will fill out the year.

Before the coming of the white men the more westerly bands of Eskimos used kayaks and omiaks (skin canoes and larger skin boats). The omiak has now disappeared from the western Arctic coastline but many kayaks are still in use. The present day kayak differs from the original type in that the sea-mammal skin covering has been replaced by one of canvas but the general design is unaltered.

Many of the natives living in the area between the Mackenzie delta and Baillie island have acquired standard whale-boats and some few have risen to well-built gasoline schooners. There is also a sprinkling of wooden, canvas-covered and other types of Canadian canoes in this area.

As the coastline is followed to the eastward all types of water-craft become less common until when Adelaide peninsula is reached it is found that the natives have there abandoned all the native forms of boats and spend the open-water season entirely on the land. In the most easterly areas many adult natives may be found who have never been afloat unless it was on a cake of ice.

Among the white residents many small gasoline schooners are operated in connection with their trading and trapping operations. During the open season a part of the population, both native and white, is limited in its activities by the lack of transport, but upon the coming of the ice everyone is turned free to travel at will throughout the country. Sleds are recovered from their summer resting places, dogs are requisitioned for motive power, and the normal conditions of the country once more obtain.

WATER ROUTE, KING WILLIAM ISLAND TO LANCASTER SOUND

It was by this route that Sir John Franklin attempted the North West Passage. On this, his last trip, he spent the winter of 1845-46 in Erebus bay, which lies at the southwestern extremity of Devon island. Proceeding west and south during the summer of 1846 his ships were beset in the ice a few miles northwest of King William island, where they remained until abandoned in April, 1848.

This water route was not again undertaken until 1903 when Amundsen in the schooner *Gjoa* reached King William island from the Atlantic waters, having travelled by way of Lancaster sound, Peel, and Franklin straits, and through Ross strait to his winter harbour at Gjoa Haven, a small inlet leading from Peterson bay, which in turn lies on the southern coast of King William island near its southeasterly extremity. After two years spent at Gjoa Haven, Amundsen proceeded by water to the westward. He spent the following winter at King point, on the coast of Yukon Territory, and during the open season of 1906 proceeded through Bering strait to the town of Nome, Alaska. At this point the schooner *Gjoa* was left and the trip continued to the southward by means of one of the regular passenger services.

In 1928 the Hudson's Bay Company outfitted the schooner *Fort James* for a trip to Lancaster sound and westward for the purpose as announced at the time, of investigating and reporting upon the possibilities of a transportation route by means of which their central Arctic trading posts might be supplied from an eastern base. Leaving Newfoundland late in July, the *Fort James*, under the command of Captain Bush, successfully navigated Lancaster sound and the waters south to Oscar bay, a point on the western coast of Boothia peninsula just north of Ross strait. Oscar bay was reached on September 6, very little trouble from ice having been encountered. Preparations were made to winter the schooner at this point, a dwelling and warehouse being erected on shore to accommodate the crew and their supplies.

Oscar bay appeared to be a well-sheltered harbour, but when the ice moved in the spring of 1929 the *Fort James* was driven ashore and slightly

damaged. After necessary repairs had been made the schooner attempted to proceed west to Cambridge Bay. This effort was made during the first twelve days of September but at the conclusion of that period the undertaking was abandoned and the schooner, which had reached a point on the south coast of King William island west of the narrows in Simpson strait, was headed eastward and eventually returned to Gjoa Haven where the party spent the winter of 1929-30.

Each year ships proceed from the Atlantic to Lancaster sound and others from the Pacific to King William island. The one barrier to the successful navigation of the North West Passage lies between King William island and Lancaster sound, a distance of approximately 300 miles. In the opinion of the writer, open water will be found through this area during some part of each season, but throughout the summer heavy ice floes which live in McClintock channel and Melville sound, move with the winds and may form a bar to navigation at any time during the season. It would appear that late August and early September offer the best chance to navigate this area.

Just how far westward a boat may proceed with a reasonable hope of returning to the Atlantic during the same season is doubtful, but should a boat reach Cambridge Bay from the eastward its chance of winning through to the outside world during the same year will be much greater if the route to the westward and the Pacific were taken than if an attempt were made to retrace its course to the Atlantic.

To sum up the possibilities of the route it may be said that the possible season of navigation is very short and subject to serious complications due to ice floes at any time. No boat has yet made a round trip through this area and it is at least in some doubt if it is possible to deliver freight via Lancaster sound to any point west of Queen Maud gulf, and to return to the Atlantic during one season. Much will depend upon the summer ice conditions which vary from year to year and much upon the prevailing winds.

TIDES, OCEAN CURRENTS, AND SUMMER ICE CONDITIONS

The tides along the Arctic coastline between Cambridge bay and Melville peninsula are strongly affected not only by the prevailing winds within the area, but also by those in Beaufort sea and Lancaster sound. A northwest wind blowing over Beaufort sea will cause the water in Cambridge bay to rise possibly eighteen inches above its normal level, even though the wind may be easterly at the point observed. It has also been noted that a northeast wind which has not yet developed at Cambridge bay will cause a decided fall in the water. When either of these conditions prevail the distant wind causing them will develop at the point of observation within twenty-four hours.

The normal tides in Cambridge bay and King William island were found to be as follows:—

Cambridge bay, observed from August 22 to September 1, 1925: Maximum normal rise and fall, twenty-five inches, which increased to thirty-four inches and fell to eleven inches as the result of wind conditions.

King William island, observed from September 5 to September 25, 1925: Throughout this period high winds prevailed which made it impossible to arrive at the normal rise and fall, but the maximum difference between high and low was thirty-two inches. At this point a steady rise was observed which continued during twelve hours, the effect of the wind more than neutralizing the ebb of the tide.

On ocean currents also the wind shows a marked effect but a normal current appears to enter Queen Maud gulf from the west, turning northerly along the eastern coast of Victoria island. A secondary current flows southerly through

Rae strait and easterly through Simpson strait, turning to the north when the main current from the west is met. On August 20, Queen Maud gulf was still covered by ice floes. During the following ten days, while the prevailing wind blew from the northwest, the floe ice worked its way north and east between Victoria island and the Royal Geographical Society islands, heading in all probability for the Atlantic by way of Lancaster sound. The ice conditions in the area south and east of King William island appear to be most uncertain, little open water being reported before mid-August, with occasional seasons when the ice remains throughout the summer. Committee bay is reported by natives as being heavily encumbered by ice floes throughout the summer season. Both here and in the area immediately west of Boothia peninsula, the natives do not use any type of boat. They report that open water is so uncertain that they cannot depend on sea-food during the summer season. The general situation regarding tides, ocean currents, and summer ice conditions may be summed up as follows:—

Tides' rise and fall, light and affected materially by wind conditions. Ocean currents as outlined. Open season of navigation from Cambridge bay to King William island; navigation possible for light draft boats for five or six weeks, commencing about the middle of August; east of King William island possible during the same period, but doubtful at all times. Committee bay, no open season of navigation.

APPENDIX B

PREPARATIONS AND SAFEGUARDS FOR NORTHERN TRAVEL

In the foregoing pages travel by schooner, dog team and aeroplane has been dealt with. Possibly something may here be said concerning the preparations and safeguards for such travel.

COASTAL TRAVEL BY SCHOONER

Coastal travel by schooner will be dealt with first. For this work a schooner not less than forty feet in length, heavily timbered and, preferably, sheeted with metal or iron bark, should be used. Anchors of greater weight than would ordinarily be used for the tonnage of the boat, together with ample lengths of anchor chains, should be provided, as much of the coast is but poor holding ground with little or no shelter. Spare anchors should be carried as experience has taught that during a season's operation, when ice conditions are even normal, one or more anchors will have to be sacrificed.

As the coastal waters are almost uniformly shallow even a comparatively light draught schooner cannot approach the shore closely, and at least one fairly heavy line, one thousand feet or more in length, should be provided. The schooner should be so rigged and loaded that it will lie hove to without too much handling. During almost any season a trip along the length of the northern coastline will necessitate the riding out of at least one blow. As the harbours are few and far between it is unsafe to count on running to shelter when the blow comes up.

All of the schooners operating along the northwestern coast are fitted with auxiliary power, internal combustion engines, of course, being used. With regard to this phase of the problem, care should be taken to have enough power to ensure headway against heavy winds and through medium ice floes. The schooner should be well equipped with spare engine parts and a full supply of repair material and tools. Soft lead sheeting for patches, copper nails, spare canvas, paint, white lead, spare planking, oak strips for reinforcing broken frames and cotton for caulking, should not be overlooked. A schooner equipped as above

and handled by a man of experience in coastal waters should meet the requirements of a trip along the Arctic coast. If the trip is to be continued east of Coronation gulf a set of sun compass charts will be found most useful as the ship's compass will then be quite useless.

Should an Arctic coasting trip be contemplated when no schooner measuring up to the above specifications as to size, weight and equipment is available, the best alternative will be a standard whale-boat, preferably fitted with both sail and light auxiliary power. If the trip is undertaken with this equipment many of the difficult situations in which a heavier schooner might find itself could be met, by hauling the smaller boat up on an ice pan, or on the shore. To travel by whale-boat, however, would mean a great loss of time as many of the wider inlets would have to be followed to their head. Only under extraordinarily favourable conditions could a round trip from the Mackenzie delta to Coronation gulf and return be made during one season by the use of a whale-boat. Coronation gulf could not be reached in time to do any considerable amount of work during the first summer.

While the various charts available are good in so far as the principal oceanographic and coastal features are concerned, they must not be relied upon absolutely as along the whole trip much coastal detail as shown on the charts is inaccurate and, as the soundings and dangerous shallows indicated are few and cover only the courses followed by a very limited number of vessels, all navigators of these waters must be ever on the lookout for uncharted dangers.

TRAVEL ON LAND OR ICE BY DOG SLED

The first essentials for this method of travel are, naturally, good sleds and suitable dogs. The sleds at present in use and which to-day appear to be the most satisfactory are of two types. The native sled or komatik is built from two planks of any strong but not too heavy wood. British Columbia fir is much favoured, although good northern spruce is also used. These planks should be fourteen to sixteen feet long, ten to twelve inches wide and two and one-half inches thick. In setting up the sled the planks are shaped as an ordinary sled runner and wooden bars lashed across them, making a sled approximately seventeen inches between the runners and with a deck about twenty-five inches wide. The front of the runners should be shaped with a gradual curve about forty inches in length, with a further very slight curve to include the rest of the runner until a point within eight inches of the back is reached, when a sharper curve will bring the bottom of the runner at least five inches above the ground. The low point of the sled should be just in front of its centre. The runner at its front should have more material added to its top to permit of the upward curve being carried to a point not less than sixteen inches above the ground. The lashing should be thoroughly and strongly done. Anyone unacquainted with the proper method of lashing should take advice from someone who understands it. In no event should nails or screws be used in any part of the sled other than in securing the iron or bone shoeing with which the runners should be fitted. The shoeing is best made of whale bone (with spring steel a second choice) of the same width as the wooden runner. It should be just heavy enough to prevent kinking. The proper thickness will depend somewhat upon the quality of steel but, with good material, $\frac{3}{16}$ -inch should suffice.

The second type of sled favoured is the Nome or basket sled. This sled is built of light hardwood strips and is put together by a system of mortices and tenons in a rather involved way that cannot be described without the use of drawings. A list of material necessary to construct one of these sleds is given below and anyone accustomed to working in wood, if supplied with an ordinary

outfit of tools will find it possible to set up the sled by examining samples in use along the coast. The list of material for one basket sled is as follows:—

- 3 pieces 1 " x 2 " x 16' first-grade, second-growth hickory
- 2 " 1 $\frac{1}{4}$ " x 1 $\frac{1}{2}$ " x 16' " " "
- 2 " 1 $\frac{1}{2}$ " x 3 " x 16' " " "
- 5 " 1 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " x 16' " " "
- 2 " 1 $\frac{1}{2}$ " x 3 $\frac{3}{4}$ " x 16' " " "
- 1 " 4 " x 3 " x 30" " " "
- 1 pair spring-steel sleigh shoes 1 $\frac{1}{8}$ " x 2 $\frac{1}{4}$ " x 16'.
- 1 gross $\frac{3}{16}$ " x 1 $\frac{1}{2}$ " fluted sleigh-shoe bolts with washers.
- 5 pounds cowhide babiche.
- 3 ringbolts, 1" ring, $\frac{3}{16}$ " diameter, 2" bolt, with nuts and washers.

Dogs suitable for work along the coast must be secured in the North. The prices asked for them will vary greatly—the merits of the dog and the point at which it is purchased both entering into the question. Roughly, it may be said that good dogs may be secured either at the eastern or western entrances to the Canadian Arctic, with the grade of dogs depreciating as the central areas are approached. The prices asked on the Labrador coast and in the more eastern areas, where dogs may be bought for five dollars each, are very much less than in the west, as there high-class dogs command one hundred dollars and upwards. The eastern dogs are in no way inferior to the western, the variation in price being accounted for by the relative difference in the price of all commodities in the two areas and by the fact that dog feed in the east is secured from the by-products of the cod fishing industry.

The most satisfactory harness can be made locally, as those manufactured in civilization will be no better in design and will labour under the disadvantage of having been made without definite information as to the size of the dogs that will wear them. A supply of soft harness webbing 1 $\frac{1}{2}$ inches wide should be provided before leaving civilization, also needles and a supply of thread and wax for making waxed ends. In estimating the amount of webbing necessary, allow seventeen feet for each dog and be prepared to make several more sets of harness than will outfit the proposed team.

One of the most difficult problems connected with winter travel is the supply of sufficient and suitable feed for the dogs. If a boat with capacity to carry all essentials is available, the question can be most easily answered by purchasing a supply of dried fish or meat, or both, before leaving the Pacific or Atlantic coasts. If good oily fish is available an allowance of one and one-quarter pounds a day for each dog while not working, with two pounds a day provided during the winter or working months, will be sufficient. If the fish or meat is dry or with little fat, one and one-half pounds a week of tallow for each dog should also be taken. With an ample supply of dog feed imported from outside the best possible results will be obtained as radical changes of diet almost invariably impair the efficiency of the team. Should it be impossible to carry dog feed into the country the traveller will be well advised to accumulate dog feed at every opportunity which may present itself within the north country. In very few localities will the local supply meet the needs of the dog teams that will call upon it.

SELECTION OF CLOTHING SUITABLE FOR USE DURING WINTER TRAVEL

A fair supply of heavy underwear, sweaters or woollen windbreakers; good canvas overalls, woollen socks, and a supply (ten yards) of medium weight drill or ticking should be taken north, also at least one dressed sheepskin with the wool still on it, to be used for boot soles. The drill will later be made into snow shirts or *parkas* and the whole outfit augmented when the North is reached by a supply of caribou skin *parkas*, trousers, boots, mittens, and socks.

These may be obtained from the local natives if the caribou skins are available. When entering the country every effort should be made to purchase either dressed or undressed caribou skins as at many points the local supply will not meet the demand while at other places they may be plentiful. Dressed reindeer skins with the hair on them make excellent clothing and are easily obtainable along the Alaskan coast. The light or medium weight skins make much the best clothing. Caribou skins will also be needed for a sleeping bag and for spreading on the snow to make a bed. Fourteen fair-sized skins will be ample to cover the needs of a man. In addition to the above, an eiderdown sleeping robe will be of great use.

Under the present conditions it is reasonably safe to look to the Canadian Arctic coast for enough caribou skins to supply everyone but should the white population be greatly increased the demand will not be met. To be absolutely safe a supply of western reindeer skins should be secured. These may be either dressed or undressed as the local natives are expert in their preparation.

CAMP OUTFIT

A travelling camp outfit is comparatively simple but differs in every way from one carried in a timbered country. For fall and spring travel a tent may be used but during the winter months (from mid-November until late in May) a snow house is infinitely more satisfactory. At least two primus stoves should be carried on each expedition as while some makes are fairly reliable the best are liable to accident or failure from some other cause. The single burner primus stove supplied with extra generators and nipples, has been most successfully used for many years. The fuel—coal oil—necessary to support a travelling party will depend somewhat on the number of the party and the amount and kind of cooking to be undertaken, but three pints a day for each camp, which may be raised to four pints should the party exceed five in number, will be ample.

Each sled should carry at least two snow knives (butcher knives with ten- or twelve-inch blades), a light hand axe, wire drying rack, files, a supply of light cordage for sled lashings and extra dog traces, a repair outfit for harness, a coal oil lantern, one snow shovel, and a supply of candles. An electric flashlight is also most useful but a good supply of batteries must accompany it as the extreme cold affects them quickly.

Overloading with guns and ammunition should be avoided as they will be little used, but one rifle and a limited supply of ammunition should be provided. While the type of rifle carried is a matter of choice it may be remarked that 30-30 ammunition is obtainable at every trade store. An ice chisel, fitted with a short shaft, is quite often of use.

The supply of cooking utensils and dishes should be reduced to the minimum but one fairly large kettle to be used for melting snow is essential. The load on the sled will be greatly lightened if a supply of dried fish or meat has been provided for dog feed. It is not practicable to cook the feed in a snow house, so the only alternative to dried dog feed is fresh meat or fresh fish, both of which will be very heavy, and troublesome to handle.

The rations carried for the personnel of the party should consist of essential staples with not too much variety and which can be quickly prepared. Rolled oats, rice, beans which have been cooked and frozen before the trip is undertaken, tea, coffee, sugar, pilot bread, and cooked bacon complete the average outfit. To this a short ration of jam may be added and a limited supply of butter and condensed milk which should be looked upon as an emergency ration.

HEADQUARTERS CAMP

The headquarters winter camp will necessarily depend greatly upon the character of the party and the transport available when entering the country.

If the transport permits, a lumber-and-building-paper house designed to accommodate the party and their work will be used, but for a lighter outfit, a double tent of heavy canvas with lumber sufficient to erect a frame strong enough to carry a considerable weight of snow (with which the tent will be covered) should be provided, and also a double glazed window and material for a floor, door, tables, benches and bunks.

The smaller camps of either type can easily be heated by a small cooking stove which can be fuelled for the winter by from two and one-half to five tons of selected coal. For lighting a camp, gasoline lamps are much in favour but coal oil lamps or candles will suffice.

In planning a winter camp do not be niggardly in estimating the necessary supply of building paper as it will give value out of all proportion to its weight. Protectors to pass stovepipe through the walls and roof are very necessary.

A light outfit of tools should be part of every outfit and should contain at least the following: cross-cut saw, rip-saw, ice-saw, hack-saw (with plenty of blades), brace, bits (up to one-inch), drills (up to one-half inch), bench axe, hammer, files (assorted), set of chisels, solder outfit with flux, and a two-foot rule.

The expendable building supply will consist of nails, screws, carriage bolts (assorted), wire (copper and stovepipe), solder, copper rivets, and of course other special supplies that may be called for by the type of work to be undertaken by the party.

Double cod lines, light cotton line, and half-inch manila rope will cover the essential cordage.

The headquarters food ration supply will depend upon the taste of the party using it, but it should be long on sugar, tea, milk, jam, and fats.

TRAVEL BY AIR

If a trip by aeroplane is to be undertaken the detail of the types of 'plane to be used, routes to be followed and mechanical and camp equipment to be provided can best be decided by the commercial air transport companies and their pilots, who have had experience in northern Canada. The prospective passenger should provide himself with warm clothing and footwear suitable both for cold and inclement weather and, should misfortune overtake the expedition, also suitable for a more or less extended trip on foot across a country where the footing will vary from rough and rocky highlands to low and, quite frequently, marshy flats.

THINGS TO BE REMEMBERED

In conclusion a few "don'ts" may be suggested: Don't go north expecting to purchase any essential part of your outfit locally. While the trade stores carry a very complete line of necessary supplies, an inconsiderable increase in the population at any point will soon deplete their stocks.

Don't form your opinion of the Arctic climate and its dangers too quickly. The Arctic climate is generally kindly, but when it shows its teeth anyone caught unprepared is in more than ordinary danger.

Don't go more than three miles from a winter camp unaccompanied by a native or by a white man of long experience. The Arctic storms come quickly and the weather on the most innocent day may change within one hour to conditions which have before proved and may again prove deadly.

Lastly: Don't go to the Arctic without a definite objective. Anyone undertaking the trip in the hope that the activities of others may make an opening which he can use to advantage will, in all probability, meet with disappointment.

APPENDIX C

EXTRACT FROM THE DOCUMENT RESPECTING THE FRANKLIN REMAINS

For an understanding of this record, compiled by Mr. George Jamme from the statements of the late Captain Peter Bayne, it is necessary to explain that it refers to occurrences in the Arctic during the seventh decade of the last century. Captain Charles F. Hall, the United States explorer, spent the period 1864-69 in the North engaged in the search for information concerning the fate of the Franklin expedition. In 1867 requiring additional white men he added to his party by taking five active members of crews of whalers wintering in the North. One of the men engaged was Peter Bayne, a native of Nova Scotia, who was an able seaman on the whaler *Ansel Gibbs*. Hall in prosecuting his researches was frequently absent from his base camps for considerable periods and during one of these absences Bayne, who was chiefly engaged in directing Eskimo hunting parties, received information from natives which led him to believe that Sir John Franklin was buried in a cemented vault in the Victory Point area on the west coast of King William island.

The extracts follow:—

The *Ansel Gibbs* spent the summer cruising about the entrance to and in Hudson bay. She had been late in getting started and unlucky in finding track of the whales; so the season was an unsuccessful one. The captain decided to winter in the bay for an early start the following year. Early in September he brought his ship into Repulse bay, where he went into winter quarters. Since Hall's coming, this small bay had become the winter haven of the whalers, and it was not long before the *Ansel Gibbs* was joined by the *Concordia*. Several days after arriving at Repulse bay, and while the crew were still busy preparing the ship for the winter's sojourn, Hall, accompanied by several natives, came aboard. Hall's relations with the whalers were very close and cordial; they brought him his mail and supplies; and acted as a clearing house in disposing of the whale-bone and things he sent out. So it was natural that this cordial relationship should extend to the crews. Soon after the ships were made snug for the winter, and the ice strong enough, the men began to amuse themselves in hunting—seals could be killed on the ice and deer on the land. These trips often brought the men to Hall's quarters on a small island a short distance up the bay from where the ships were quartered; also, to Talloon Harbour, two miles distant, where the native Eskimo settlement was situated; and the men of the different crews soon became well acquainted with the natives. Bayne was one of the foremost in these excursions—he had youth and spirit, was a good shot, and got enjoyment out of this kind of life. Frequently he went hunting musk-ox, out on the tundra west of the bay, with some of the natives. His superior marksmanship won for him their high respect and they were glad to accompany him, especially as he was generous in the division of the trophy. Out on these trips he occasionally spent a week at a time with the natives, either in the field or in their camps, and, as he was full of life and mischief, was no doubt welcome. He states he acquired much of the Eskimo language in the usual way. So it came about that when Hall, in the spring of 1867, became fearful for the safety of his cache at cape Weynton and had asked the whaling captains for the loan of a few men to help him, he chose Bayne as one of them. Cape Weynton is 80 miles north from Repulse bay and on the way to King William Land, and the cache here was part of Hall's plan for his projected expedition. As previously stated, the cache was found intact. On the return, Bayne shot several musk-ox and deer which were cached at convenient points. The feature of this trip was the fact that Bayne established himself in Hall's estimate as a successful hunter.

As part of the program for the King William Land expedition the following year, Hall planned on taking a number of white men with him; and, as summer approached, he discussed the matter with the whaling captains who gave him permission to take 5 men out of their crews, if he could make satisfactory arrangements with the men to participate. The selection of these men was of course very important. Hall called for applications, and out of the number offering selected Peter Bayne, Frank Lailor, Antoine—, John Spearman, and Pat Coleman. Bayne and Lailor had already been with Hall on several [hunting] trips, so he had a good idea of what kind of men they were; the others were selected because of the personality they presented. Papers were formally drawn by the ship captains, releases given, and contracts made. Hall agreed to employ the men for a period of one year—Aug. 1867 to Aug. 1868—and to pay them a certain wage

—payment to be made either on their return to the ships or by draft on New York. In turn, the men agreed to serve at whatever work Hall might put them, and to be satisfied with whatever subsistence he might be able to provide—it being understood that they practically had to live off the country. The men stayed with their ships, participating in the whaling operations in the northern part of Hudson bay, until late August, when they took up their camp at Talloon Harbour, near where Hall but a short time before had moved. Quarters at Talloon camp were like most Arctic camps—a framework of light wood faced on the outside by broad layers of sod, and, as winter comes on, snow tunnels are added as a protection against the wind. There were tents there also, but these were intended mostly for summer use or for travel. The five men fixed themselves up with sizable quarters, then settled down for whatever their winter's work might be. At the time, the settlement consisted of about 60 souls. . . .

It is easy to conceive that Bayne, and the four other white men, by this time must have had a pretty fair idea of the general ending of Franklin's expedition. Hall unquestionably had to tell them something of it when he employed them, and no doubt told them a great deal more after they came formally under his command—this latter by way of inspiring them to greater exertion and loyalty. Again, the disastrous ending of the expedition and the unseemly death of the entire membership, had made a great impression on the natives of the region; some of these latter had practically been witnesses, and the story spread from settlement to settlement, as all such stories do, until the entire native population knew about it, in fact, probably every settlement had relics of the expedition—it was the greatest thing in the lives of these native people, and they were ready at all times to talk on the subject. So it was natural, whenever an opportunity came, to discuss it with the natives; and it was natural for Bayne, who perhaps had heard more of it from Hall than the others, to ask questions of the natives. . . .

In relating the incidents of this 30-day hunting trip, Bayne says that besides the two native men and their wives, there was a boy of about 12 years and a girl a little older, and a child going on his third winter. One man and his wife were in the forties, the others about 10 years younger. . . . Bayne said that frequently, when they were in the igloo together, that the conversation would turn on Franklin's Expedition. Each of these natives had talked with other natives who had been on King William Land and witnessed, or in some way knew intimately the events of the disaster; had heard of the distribution of the relics—had even seen some of these latter; they knew of Crozier's attempt to reach Fort Churchill, etc., etc. Crozier seemed to interest the natives more than any of the others. Apparently this interest was widespread among the different natives. . . . From Bayne's description of these conversations, several things came up that apparently were new. They mentioned that, during the first summer (probably 1847), that many of Franklin's men came ashore; that they caught seals like the natives, and shot geese and ducks of which there was a great number; that there was one big tent and some small ones; and many men camped there. . . .

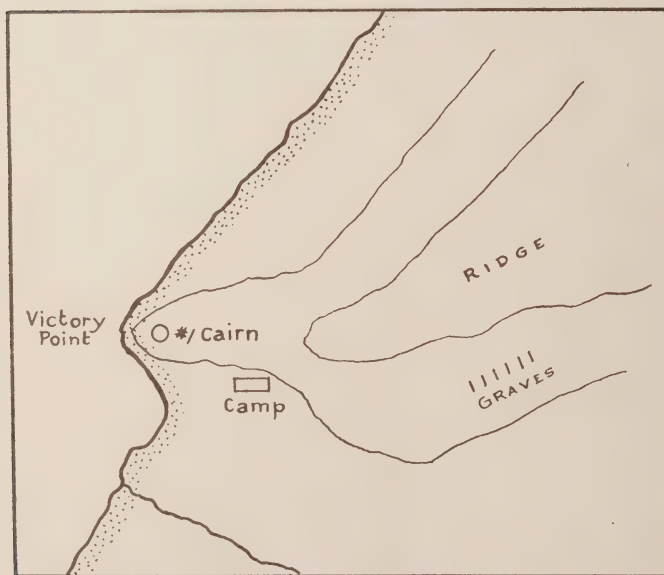
On his return to the Talloon camp, about the first of March, Bayne found there was to be a change in the general program. A short time before the Eskimo from the northern part of Melville peninsula had arrived with the news of the tracks of white men along the south shore of the straits of Fury and Hecla. . . . The information, of course, had immediately excited Hall's interest and, after he had secured all the facts, concluded it was possible the tracks might have been made by a remnant of Franklin's crews—therefore, his duty to go at once and bring any survivors out. Years before, a party under Sir John Ross had left a large cache on the upper west shore of Melville peninsula; Franklin knew of the location of this cache and it was thought not unlikely that he had directed some of his men to it. Hall discussed the matter with the whaling captains. He had pledged himself to his financial backers, to go to King William Land. But the new situation seemed imperative. It seemed the proper thing to do to investigate the story. The captains concurred in his ideas; so he decided to go at once. He figured he could make the trip and be back in time to start for King William Land, as planned. Preparations were then rushed and, after considerable delay on account of dogs, the start was made on March 23. The outfit consisted of about 3 tons of supplies loaded on two sleds; and the party, of Joe and Hanna and 10 other natives, including impedimenta, etc., and Frank Lailor. . . . Hall did find evidence of white men having been in the region, but several years previously; and concluded the men might have been of Franklin's crews; of this, however, there was nothing definite. He returned to the Talloon camp June 24, having been gone 96 days. It was of course too late to undertake the King William Land expedition.

Before leaving on the Fury and Hecla trip, Hall had laid out work for the white men to do during his absence. Spearman and Antoine were to remain at camp getting together the paraphernalia, looking after the dogs, etc., and Bayne and Coleman were to continue hunting and *cacheing* meat supplies along the route towards Committee bay. Bayne started out about the last of March, making camp at the Upper Narrows lake, about 30 miles north from Repulse bay. With him and Coleman, this time, were three Eskimo families—the older man and wife of the previous trips, and their boy and girl;

Sketches taken from "Jamme Report" 1929



Map: showing course taken after abandoning ships, position of Cairns, Graves, Relics, etc.



Sketch: From Captain Bayne's Map, showing position of Camp, Graves, and probable location of Franklin's Tomb.

and two different younger couples who, together, had three young children. The party hunted through to early May, securing and *cacheing* 21 deer and 9 musk-ox. The weather was bad during some of the time, so there were days on which no hunting was done. Late in April the camp was visited by a Pelly Bay native who had with him his wife and three children, the latter fairly well grown. A few days later, two men and a woman from Boothia peninsula came in. . . . Both the Pelly bay natives and the Boothia natives had been to King William island. The former declared he had seen Crozier at Pelly bay, but was not sure of the date. The Boothia natives said that their people frequently went to King William island to hunt seal, they considered it their own particular hunting ground, and that they always went there in the spring after the wind had been blowing for a long time from a certain direction. The older man did most of the talking and related that he and his wife were at the north end of the island during the spring and summer of the first year, and the summer of the second year, the two ships were fast in the ice. The couple had a baby boy then that was "two winters old"; the boy was now married and had a child "one winter old." The couple would, therefore, probably be in the twenties at the time they described, and capable of making correct observations. In relating the events that took place, he said he had not gone out to the ships but other natives had, and had camped alongside for several days, and had seen and talked with Franklin; that many of the white men came ashore and camped there during the summer; that the camp had one big tent and several smaller ones; that Crozier (Aglookna) came there some times, and he had seen and talked with him; that seal were plentiful the first year, and sometimes the white men went with the natives and shot seal with their guns; that ducks and geese were also plentiful, and the white men shot many; that some of the white men were sick in the big tent; and died there, and were buried on the hill back of the camp; that one man died on the ships and was brought ashore and buried on the hill near where the others were buried; that this man was not buried in the ground like the others, but in an opening in the rock, and his body covered over with something that, "after a while was all same stone"; that he was out hunting seal when this man was buried, but other natives were there, and saw, and told him about it, and the other natives said that "many guns were fired." Bayne realized that the statements given by the Boothia native as to the white men coming ashore, and of their hunting with the natives, and their camping there and the description of the camp, and some of the men being sick and dying and being buried ashore, and of the funeral from the ships and the guns being fired, were all new and important. Bayne says that Coleman was even more strongly of the opinion than himself, and the latter became quite excited over the matter. . . .

Finally. . . he got the Boothia native to give a description of the tenting ground and of the place where the men who died were buried. From the description given, Bayne figured the camp to have been about a fourth of a mile back from the beach, and about the same distance south of where the ships' boats usually landed; that it was situated on a flat-topped mound near the base of a low ridge; that the crest of the ridge was not very wide and was formed of projecting rocks; and that the slope on the other side faced the south-east.

When Bayne returned to the Talloon camp about the middle of May, he immediately told Spearman about the information the Boothia native had given him; and Spearman, like the others, saw the importance of what was said. So they consulted together as to how they should hold the native in camp until Hall's return. The native had arrived a few days before Bayne, had been out to the ships where the whalers had given him a small amount of powder and shot, and some other things he thought he needed, and was now about ready to return to his home settlement. It was decided to get the native to repeat the story over again in the presence of some of the Talloon natives, so as to get all the facts possible, and as correctly as possible, through the local natives as interpreters. It was found that the Boothia native had already been going over the story with the local natives; that his wife had been telling the native women here what she herself had seen and knew; and the local natives were by this time well informed. As has already been stated, the Franklin disaster was the greatest thing in the lives of the entire native population of this part of the continent, and every one was keen to get first-hand information. It was arranged that there should be "plenty tea" at the white man's camp, and the native population soon flocked there to have Bayne tell them of his hunt, and this was used as the occasion to get the Boothia natives to tell about Franklin. So it came about that both the man and the woman repeated the account of their experiences before Spearman and Antoine, and many of the local natives. . . . The only thing new that developed out of these recitals, other than what Bayne had already learned, was that there were several cemented vaults—one large one, and a number of small ones; that the natives thought that these latter contained only papers, for many papers were brought ashore—some blew away in the wind, but others were buried. These natives had seen a number of the dead white men since that time, whose bodies lay as they had died, now frozen in the snow. Bayne and Spearman drew maps and got the natives to try and

locate the camp and the graves and the ridge with respect to the beach. The sketch attached is made by the writer [Jammel] from memory from a map Captain Bayne had among his papers, but which cannot be located now.

The idea in the minds of Bayne and Spearman, in getting the Boothia natives to recount their story to the local natives, was to have the information for Hall on his return from Fury and Hecla, and in such shape that it would be useful to him—the Boothia natives had to return to their home region before the snow left the ground, and it was not known how much longer Hall would be gone. The motive in doing it was only loyalty on the part of the men. But, to their astonishment, when Hall returned late in June, he rather resented their acts, upbraiding them for their presumption. This is where Hall made a grievous mistake. His attitude was offensive to the men, and they began to lose interest; which latter, in turn, brought about friction. The whole culminated in the shooting of Coleman by Hall, July 31, and Coleman's death on August 14. [Hall gives this occurrence in detail in his published works. He states that the shooting was done to quell a mutiny led by Coleman, who opposed him with physical violence.]

Hall was heartbroken at the happening and tended Coleman as only one such would. Bayne says that Coleman was wrong in his attitude and actions, but that the situation had not yet reached the point where it became necessary for Hall to resort to firearms. Hall, however, had to maintain his own standing of respect by the natives. The happening brought about the departure of the four other white men who, a few days after Coleman's death, boarded the first whaler that came in, the *Ansel Gibbs*, and returned on her to the States. They received their full pay from Henry Grinnell when they arrived at New York.

It is not known whether Hall queried the local natives as to the recitals of the Boothia natives; presumably he did. In his records he mentions cemented vaults in which papers have been placed; but in no way mentions the burial of Franklin—either in the deep or on the land. Bayne, in speaking of Hall, always referred to him with the greatest respect and regard. He gave him full credit for being a high type of man and wonderful in his ability to accomplish so much in a scientific way. But, said Hall was wrong in not giving to the world this information as to Franklin's burial place. He accounts for Hall's attitude as one of pique; and his action in withholding the information from his records, as the stand of a strong-willed man. The great ambition of the old Captain [Bayne] was that he might be able to go, himself, and prove to the world the existence of the Cemented Vaults.

MAP BASED ON BRITISH ADMIRALTY CHART
OF 1927 SHOWING THE VARIOUS POSITIONS
IN WHICH RELICS HAVE BEEN FOUND.



